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Pit and Quarry

With which is consolidated
CEMENT-MILL & QUARRY

May 4, 1932

MAY 9 1932

# *This Is Defeatism*

Budgets for 1932 do not exhibit the courage that is the boast of business. There is too little of the spirit of general confidence that is essential to business recovery; there is too little forwardness for healthy rehabilitation.

Money can not be made without spending money. No one denies that, yet much of present-day business is apparently conducted on the theory that business will revive if one only waits long enough. While there is much truth in this statement, its acceptance involves indefinite delay, just what irks the business man to-day. He wants action, recovery, certainty, yet he does nothing to attain any one of them. He idles, procrastinates and rests on his oars, drifting in a business calm.

This is not wisdom; it is not courage, or confidence, or good sense. It is complacency, resignation, defeatism. It is the curse of business; it is the principal cause of this long-drawn-out period of subnormal activity and subnormal thinking.

Some men refuse to buy because they can not pay cash. Did they never buy on credit before? Others complain that they can not see any certainty ahead. Were they ever able to do so? Others say they must look out for themselves and let the devil take the hindmost. Is such a stark individualism the germ that gave us our present highly socialized civilization? Yet others in their despair cry out "What's the use; everything's gone to smash!" Is that the spirit that made a habitable and comfortable country out of a wilderness?

You need new machinery, better machinery—but not more machinery—to meet the new competition ahead of you. Buy it. If you can not pay cash, buy it on time. You can not continue to cut prices without cutting production costs, and you can not take it all out of labor and keep your profits intact; the last few years have shown that. You can not continue indefinitely to do business without profit; your surplus will not last forever. You can not wait for the other fellow to begin because, by the same queer reasoning, he is waiting for you.

The future is just as bright as it ever was, the past just as unimportant, and the present just as rich in opportunities. The trouble is in distorted vision. The law of cause and effect has not changed a particle. If you build wisely for the future, you will earn your proper rewards just as surely. Confidence in the future, in the country, in your own business is a matter of self-confidence, and that begins with you. If you have no faith in yourself or your business or the future of your work, how can you expect others to believe.

The spirit of defeatism is never worthy of even the faintest man. Just now it is the bane of the times and the greatest obstacle to business recovery.

*Since September 11, 1929, the largest net paid circulation in the field*

# What is the *True* MEASURE of Wire Rope service?

Variations in rope life are experienced by practically every rope user. Ropes encounter varying service circumstances. Operating conditions, as well as rope maintenance and equipment conditions, change from time to time, even on the same piece of equipment. As a result, rope life varies too.

It is easy, therefore, to see why the service given by a single rope is not necessarily a criterion of the *general* service that make or design of rope will provide.

Many years of experience and close contact with thousands of diversified installations of wire rope have convinced this company that there is only one fair and reliable basis on which to compare the service of wire ropes:—the basis of *average* service.

Roebling is glad to have its ropes put to this severe test. It advocates the "Average Service" method of determining rope cost, in which cost per ton of material handled, mile traveled, or other measuring unit, is based not merely on the service of a single rope but on the *average* service of several ropes.

JOHN A. ROEBLING'S SONS COMPANY, TRENTON, N. J.

*Wire · Wire Rope · Copper & Insulated Wires & Cables · Welding Wire · Flat Wire · Wire Cloth & Wire Netting*

Branches in Principal Cities — Export Dept.—New York, N.Y.

### *A plain statement about Wire Rope Economy*

Roebling does not indulge in nor encourage sweeping claims of superior wire rope economy. Such claims, if generally made, would merely confuse the rope user. ¶ For the guidance of rope buyers, however, Roebling does assert that when gauged by the work performed, NO wire rope, regardless of make or construction, will show lower general average operating costs than Roebling.

### *Wire Rope for all purposes*

There is no such thing as a wire rope "cure-all". No one design of wire rope is suitable for all purposes. ¶ Roebling makes wire rope of a great variety of types and constructions, and therefore can supply a wire rope exactly suited to each particular requirement. ¶ The great stamina of all Roebling Ropes is primarily due to the quality of Roebling Wire. This Acid Steel Wire is renowned for its fatigue and wearing qualities. No better rope wire is produced. ¶ "BLUE CENTER" STEEL is the highest grade and is generally recommended for severe duty.

## JOHN A. ROEBLING'S SONS COMPANY

# Guaranteed Estimates of Pump Economy

YOU have nothing to lose and likely much to gain by investigating the Hydro Seal Pump, for we are prepared to make definite performance guarantees to support our estimate of economies in your plant. We seldom find a sand, rock or sludge pumping job where the Hydro Seal Pump cannot pump one-half more material with no increase in power or save one-third in power with no decrease in production. If a new pump would introduce such savings in your plant, it is false economy to delay its purchase simply because your present pump still runs. We have offices in twenty cities, one of which is probably near you. Write us, describing your conditions, and one of our sales engineers will call when in your vicinity. Bulletin on request. The Allen Sherman Hoff Co., 215 S. 15th St., Philadelphia.

**HYDRO SEAL**

# Pit and Quarry

With which is consolidated
CEMENT-MILL & QUARRY

Volume 24 May 4, 1932 Number 3



MEMBER AUDIT BUREAU OF CIRCULATIONS

Published bi-weekly on Wednesday for producers and manufacturers of Cement, Crushed Stone, Gypsum, Lime, Sand, Gravel and other nonmetallic minerals. Entered as second-class matter October 9, 1928, at the Postoffice at Chicago, Ill., under the Act of March 3, 1879.



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# THE PLUS THAT COMES WITH GOODYEARS

The fact that Goodyear Conveyor Belts carry more tons at lower belt cost is well and widely known in the rock products industry.

WHY they should unvaryingly deliver this more efficient, more economical performance may not be so well understood.

It is because there comes to every pit, quarry and mill with every Goodyear Belt — Conveyor or Transmission — something much more valuable, much more important, than so much rubber and so much duck, so many feet long, so many plies thick, so many inches wide.

There is a PLUS in Goodyear Belts over and above even the best of belting materials. It is the PLUS assured by Goodyear's scientific construction, based on years of experience in conveyor belt manufacturing, and the practical, expert analysis of the G.T.M.—Goodyear Technical Man.

Put the two together—the scientific knowledge of how to build a *balanced* belt, body and cover, and how to apply that belt *in the right place*—and you are bound to get Goodyear better, lower-cost performance.

Why not go over this matter of longer-lived, more trouble-free, lower-cost belting with the G.T.M.? A word to Goodyear, Akron, Ohio, or Los Angeles, California, or to the Goodyear Mechanical Goods Distributor nearest to you, will bring him to your plant.

**TUNE IN:**
Goodyear invites you to hear the Revellers Quartet, Goodyear Concert-Dance Orchestra and a feature guest artist every Wednesday night, over N. B. C. Red Network, WEAF and Associated Stations

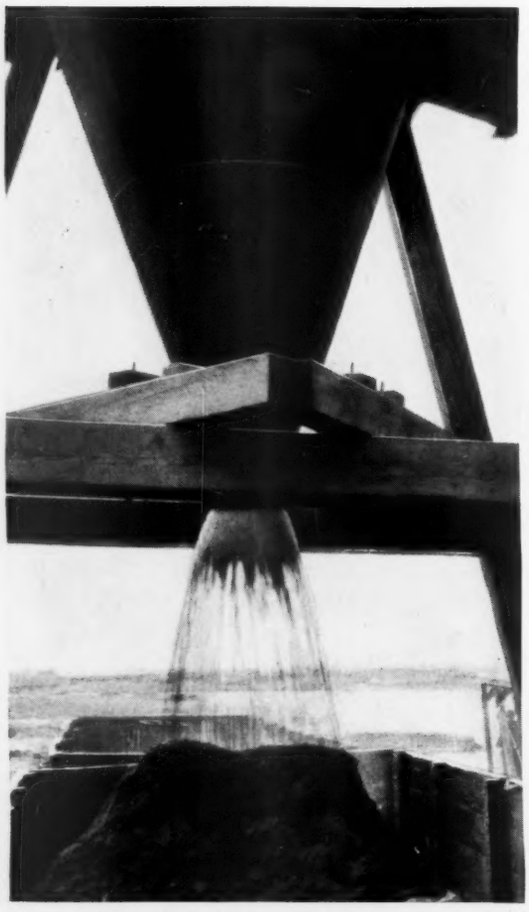
**BELTS**
**MOLDED GOODS**
**HOSE**
**PACKING**

THE GREATEST NAME IN RUBBER

GOODYEAR

# CLEAN, SHARP *and*

# Produced at the



The Link-Belt Automatic Sand Separator.

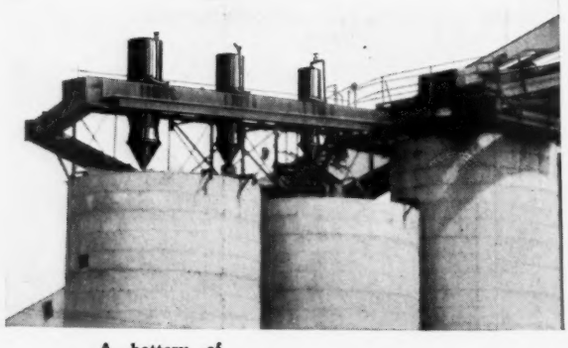
## Some Link-Belt Methods of Sand Classification and Dewatering

No matter how exacting or varied your sand preparation requirements may be Link-Belt has the experience and the equipment to meet them.

Flight and screw conveyors with their mechanical dewatering will produce a drier sand than can be obtained with the automatic devices, but the latter will effect a better grading. The screw conveyor method is suitable for small and medium capacities, and the flight conveyor for equivalent results with greater volume.

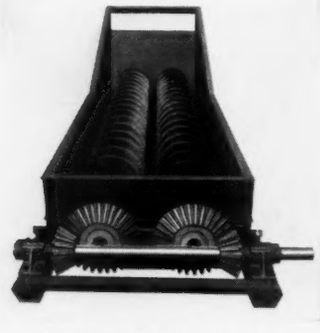
The Shaw classifier was developed to clean and classify sand automatically to meet the most exacting specifications. It is the most accurate of all devices, giving a controlled grading which can be varied to suit requirements.

The automatic conical separator is the lowest in cost, and most economical device for producing an average grade of sand.



A battery of three Shaw classifiers.

Link-Belt inclined conical screens and dewatering flight conveyors.



A Link-Belt 20" twin screw washer.

# LINK-BELT

# UNIFORM Aggregates

## *Lowest Cost per Ton*

A complete Link-Belt sand and gravel washing plant.

The Link-Belt vibrating screen. A triumph of mechanical vibration.

Link-Belt steel apron feeder for aggregates.

It isn't always necessary to redesign completely, to meet present day specifications and make a profit on production. Possibly an additional unit or replacement here or there may be all that is required.

Put up to Link-Belt the responsibility for the balanced arrangement and correct application of the right equipment and methods to meet your requirements. For washing, screening, sizing, conveying, elevating, mixing, or excavating, there is a variety of equipment in the Link-Belt line that includes every device and unit that could be required. Unbiased selection of the right equipment to give exactly the right results, is assured. The solution of your problem is reached, dictated solely by the demands.

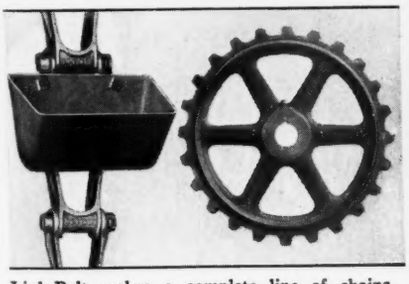
Can your present methods be improved, costs lowered and product bettered, to meet today's markets at a profit? Send for catalogs.

LINK-BELT COMPANY

CHICAGO Works, 300 W. Pershing Rd.
CHICAGO, Caldwell-Moore Plant, 2410 W. 18th St.
INDIANAPOLIS, Ewart Works, 200 S. Belmont Ave.
PHILADELPHIA Works, 2045 W. Hunting Park Ave.
SAN FRANCISCO Works, 400 Paul Ave.
In Canada—Link-Belt Limited—Toronto works; Montreal; Vancouver

*Offices in all Principal Cities*

4525

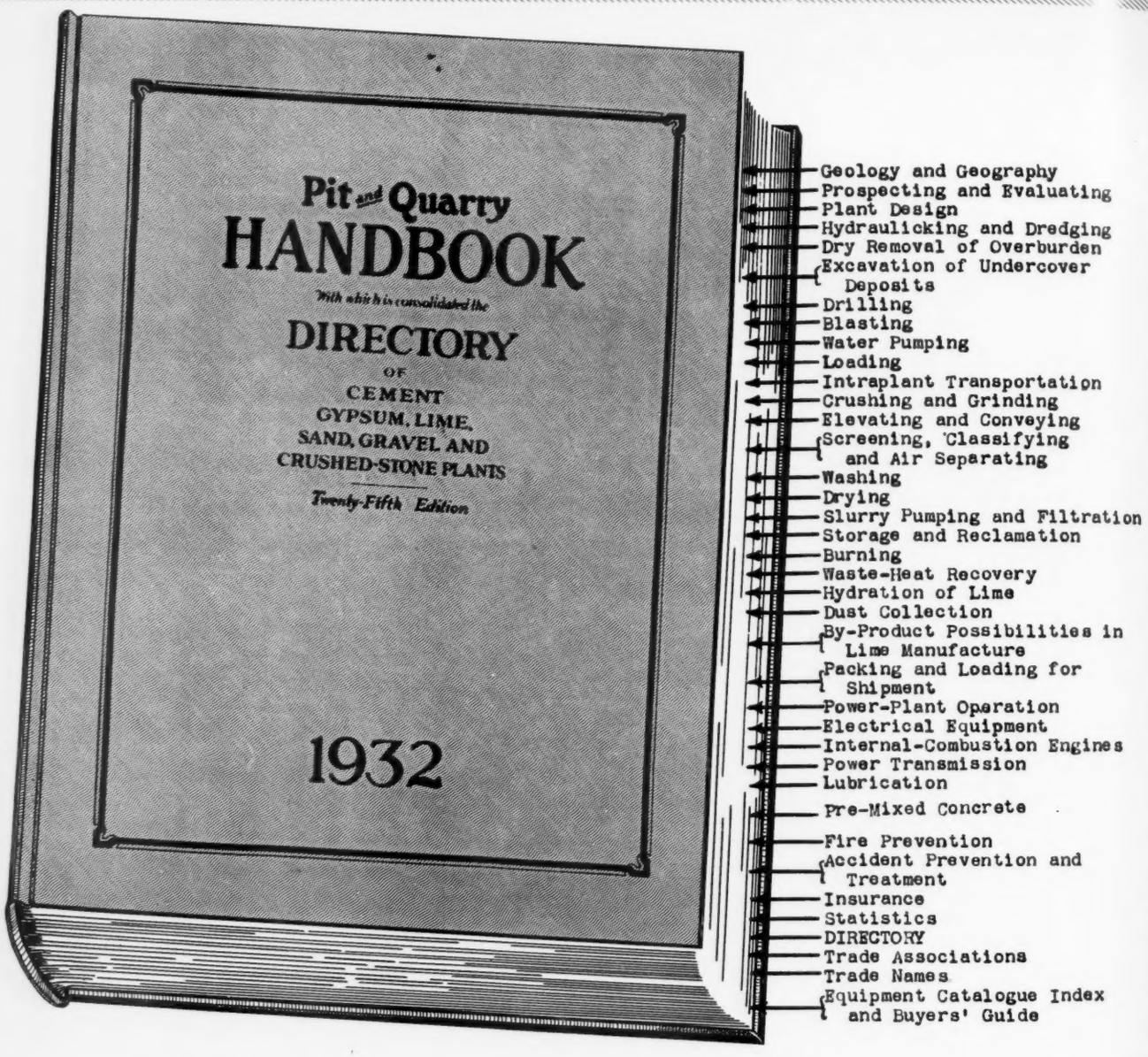


Link-Belt makes a complete line of chains, sprockets and buckets for every service.

Link-Belt inclined conical screens. Each group mounted on one continuous shaft, with progression from large to small in the separation of sizes.

The Link-Belt shovel-crane-dragline is built for heavy duty service in capacities from ¾ to 2½ yards.

# Sand, Gravel, Stone, Cement, Lime Handling and Preparing Equipment




# Here It Is, at a Glance—Brand New!

The illustration above shows, graphically, the contents of the 1932 edition of Pit and Quarry HANDBOOK and Directory, just off the press. The only book of its kind. Every section has been brought right up to the minute. The Directory is the largest and most complete listing of producers ever compiled—and every item is *verified*.

If you have not already purchased your copy of this indispensable book, order now, before the limited printing is exhausted.

| | | | |
|---|---|---|---|
| Pit and Quarry Handbook and Directory, 1932 edition..... | $5.00 | Clubbed with a 1-year subscription to Pit and Quarry..... | $6.00 |
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## Pit and Quarry Publications

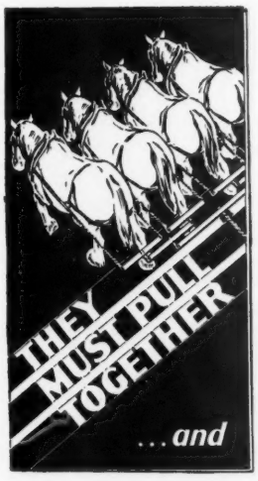
**538 S. Clark St., Chicago, Ill.**

PIT AND QUARRY HANDBOOK  PIT AND QUARRY  PIT AND QUARRY DIRECTORY

# NO WONDER HE'S GOOD . . . . *with that background*

"No wonder he's able to tell us what explosives can do and show us how to use them. No wonder he's able to bring us the solution of difficult problems. We expect good advice, good service and good explosives when we work with an Atlas representative—and we *get* them!"

Let the Atlas Representative who calls on you—*work* with you. Let him place at your disposal, too—not only his own competence as an individual—but the knowledge and experience of the entire Atlas organization. Let him bring to you the benefits of the complete engineering, research and production resources that have won such wide-spread recognition for Atlas products and Atlas service.




## . . . So Must Drill Hole Charges

Electric blasting provides this simultaneous firing which is needed to pull maximum yards per dollar of blasting cost.

ATLAS Electric Blasting caps of the patented match head type excel in uniform firing and insure the complete and simultaneous detonation of charges in well drill hole blasting.

Ask the Atlas representative for the new leaflet on Teamwork or write direct for a copy.

## ATLAS POWDER COMPANY

A proper explosive for every blasting requirement

**WILMINGTON, DELAWARE**

BRANCH OFFICES:

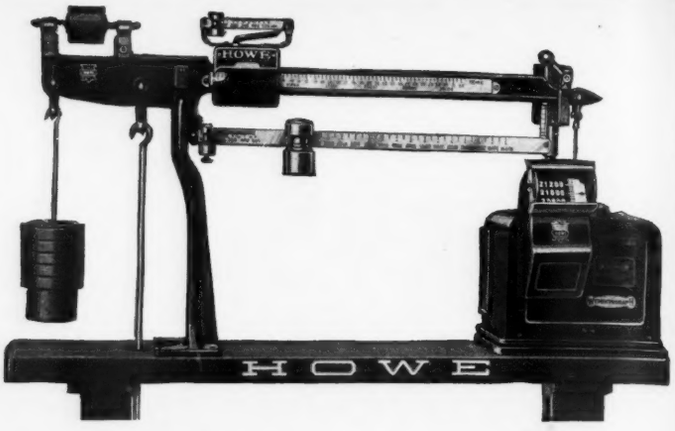
Allentown, Pa.; Boston, Mass.; Charleston, W. Va.; Denver, Colo.; Houghton, Mich.; Joplin, Mo.; Kansas City, Mo.; Knoxville, Tenn.; Memphis, Tenn.; New Orleans, La.; New York, N. Y.; Norristown, Pa.; Philadelphia, Pa.; Pittsburg, Kans.; Pittsburgh, Pa.; Pottsville, Pa.; St. Louis, Mo.; Tamaqua, Pa.; Wilkes-Barre, Pa.

ATLAS EXPLOSIVES

# ATLAS EXPLOSIVES

ON THE WEST COAST WRITE THE GIANT POWDER CO., Cons., San Francisco, Cal.

# Let the HOWE *Weightograph* EARN for YOU, *too!*




"During the three years, the instrument (Weightograph) has weighed for us from 750 to 1000 tons per day, representing between 200 and 250 trucks. Time saved our clerk in weighing the trucks has enabled us to sell *at least 250 tons* of sand and gravel *more* than we would without the Weightograph." . . .

This excerpt from a letter of a large sand and gravel producer typically illustrates the earnings produced by the Howe Weightograph . . . Sand, gravel, crushed stone, slag, lime, gypsum, cement and other rock products producers all over the country have increased production, eliminated weighing losses—obtained *extra* profits—by the Weightograph.

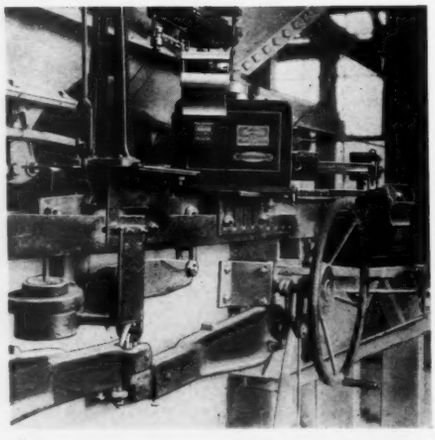
You attach the Weightograph to your beam scales; you do not discard your present scales.

When attached the Weightograph realizes these weighing (and operating) economies:

1. *Speedier* weighing, with an instant, automatic balancing of the load. Weightograph weighing is fully 75 per cent faster than straight beam weighing.

2. *Precise* weighing. The Weightograph eliminates entirely the variable human element in weighing. The *precise* weight of the load is automatically indicated on a ground-glass reading screen; there is no clumsy manipulation of poises, no possibility of error in the load reading.

No other weighing instrument offers these advantages—that distinctly create greater operating profits for you!



*The Weightograph is especially adaptable for concrete batching. Photo shows Howe Scales and Weightographs on weighing batcher of a large Philadelphia central-mixing plant. Write for particulars of "Weightograph-controlled" concrete batching.*

HOWE

This year it is imperative for you to eliminate every inefficiency—every operating loss—in your plant. It is imperative to convert these losses you are now suffering into *earnings*. If you still maintain old-fashioned, inefficient beam weighing in your plant, now is the time for you to install the Howe Weightograph and obtain its earnings!

This year you cannot afford to be *without* the Weightograph!

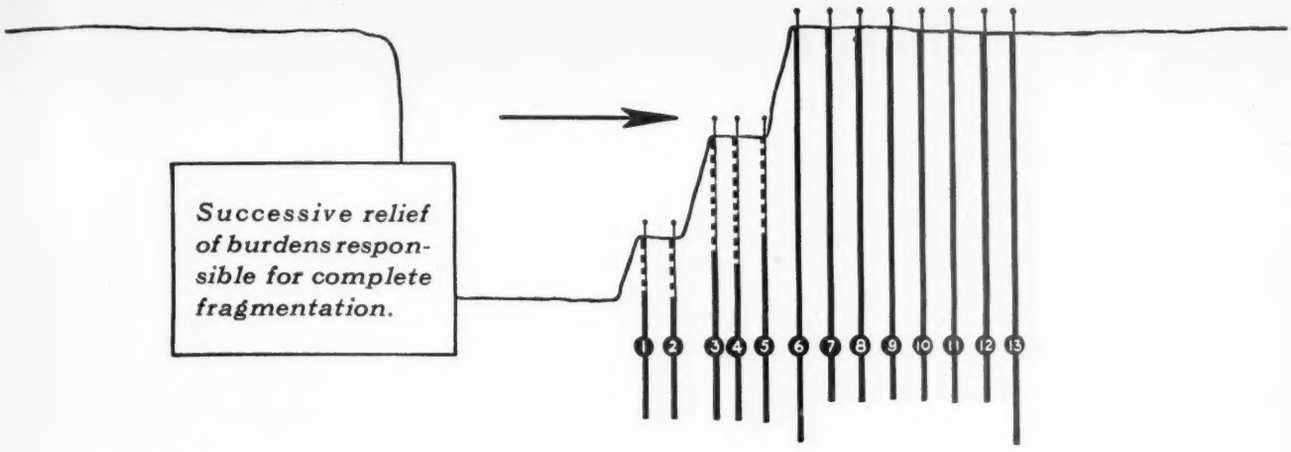
*Write today for a copy of our descriptive brochure, "There Is Nothing Like The Weightograph," which will bring you all the facts of the Weightograph and the earnings it can produce for you.*

*Also Scales of every type for the rock products industries*

## THE HOWE SCALE COMPANY

### Rutland, Vermont

*Branches and Representatives in All Principal Cities*



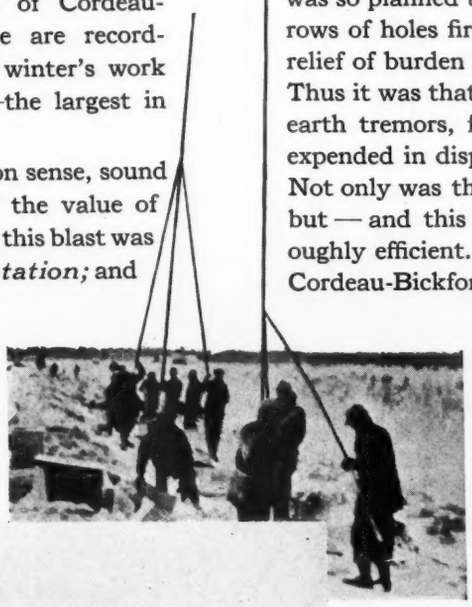

# MANISTIQUE··
## *the largest blast in history*
## made possible by CORDEAU-BICKFORD

YOU doubtless have seen the statistics: an area 4,400 ft. long by 200 ft. wide, containing over 4,000 6-in. holes with a total footage depth of over 125,000 ft., 440,966 lbs. of explosives and 199,273 ft. (about 38 miles) of Cordeau-Bickford Detonating Fuse. These are record-breaking figures: they represent a winter's work consumated in one gigantic blast—the largest in history.

But back of this size is sound common sense, sound engineering, and a new proof of the value of Cordeau-Bickford. For the object of this blast was not mere displacement, but *fragmentation;* and to get this result it was essential that the load should go in successive stages. To the camera eye it appeared as one huge instantaneous blast and only one electric cap was used; but the Cordeau hook-up was so planned that successive holes and successive rows of holes fired in a distinct rotation to permit relief of burden by stages.

Thus it was that the shock did not result in violent earth tremors, for the force of the explosive was expended in displacing *and fracturing* the stone. Not only was the blast an outstanding one for size, but — and this is most important — it was thoroughly efficient.

Cordeau-Bickford has made the modern giant blast possible—*and practicable.* The Ensign-Bickford Company, Simsbury, Connecticut.



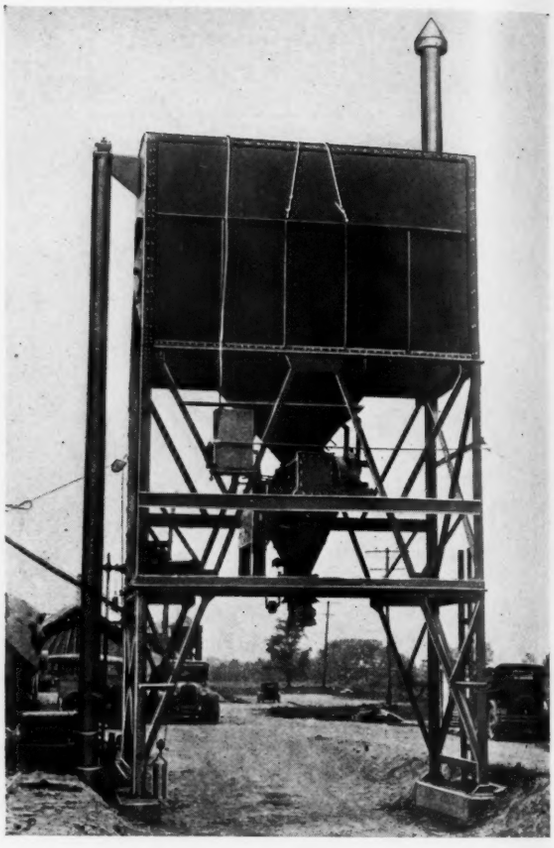
Loading and placing the stemming material.

Close-up view after the blast. Notice the complete fragmentation — ready for the shovels.

CORDEAU BICKFORD
DETONATING FUSE

# SPROUT-WALDRON'S

## New Vertical Screw Bulk Cement Unloader



**Moves Bulk Cement from cars to Batcher Bin or to Storage 40 to 50% cheaper than ever handled before.**

**A portable, practical, economical, self-contained unit that can be used for unloading bulk cement from any kind of car. It is weather tight and can be used with any bin. It operates automatically. Road Contractors, Builders, and Cement Companies using it say it is more economical than a Bucket Elevator and handles Bulk Cement with a cleanliness that has been heretofore impossible. Investigate this new outfit that quickly pays for itself out of savings.**

*Sprout, Waldron-Timken equipped Belt Conveyor Idlers insure low cost, trouble free Transportation of Bulk Materials from one operation to another.*

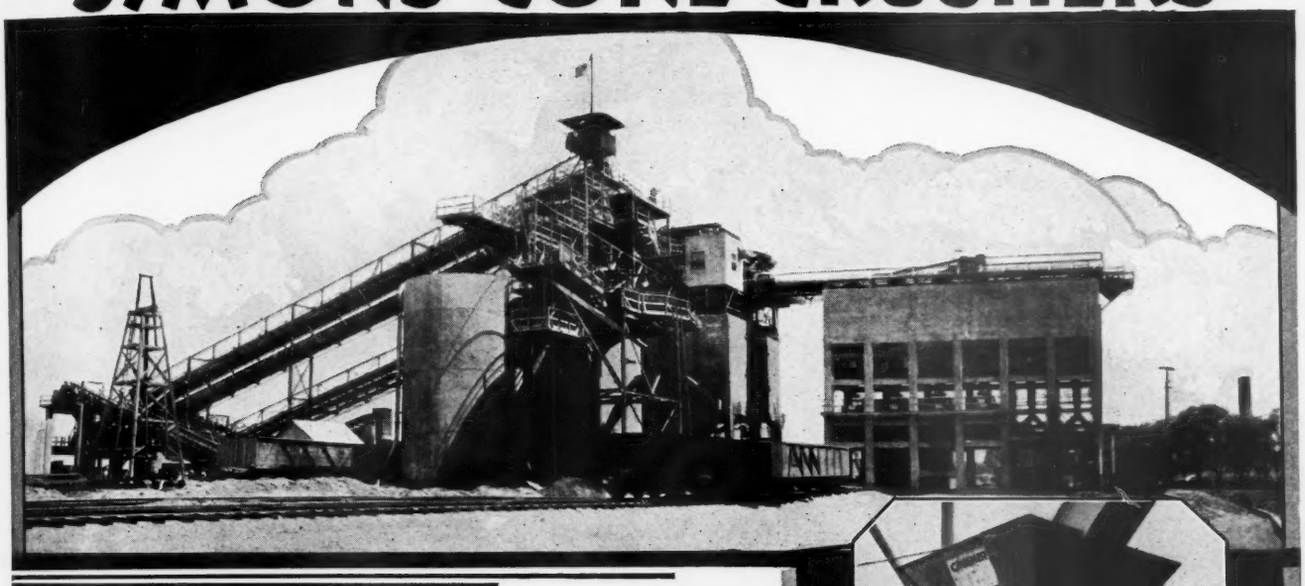
**Sprout-Waldron also Manufactures Elevators and Conveyors for all materials: Screw Conveyors, Power Shovels, Car Pullers, Buckets, Shaking and Vibrating Screens, Gears, Pulleys, Sprockets, Bearings, Clutches and other Transmission Appliances.**

***Write for a Sprout-Waldron Estimate on all your Material Handling Equipment needs or if you wish we will have one of our Sales Engineers call without obligation.***

# SPROUT-WALDRON & CO., Inc.

*1221 Sherman Street* — SALES ENGINEERS LOCATED THROUGHOUT THE U. S. — *Muncy, Pa.*

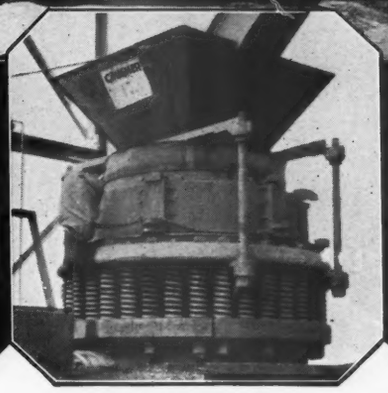
# America's Finest Gravel Plant
## *And It, Too, Has*
# SYMONS CONE CRUSHERS



WHAT is believed to be America's outstanding gravel plant is that of the Kaiser Paving Company at Radum, California. It is the last word in gravel plant design, built to furnish a product that meets the most rigid specifications and at the lowest possible cost.

As in most leading crushing plants, here too is installed a Symons Cone Crusher. This is one of the factors for the successful showing this plant has made. It is one more evidence that leaders standardize on Symons Cones for reduction crushing.

Here also another Nordberg product is in service, a Nordberg Track Shifter. This machine takes the place of hand labor when shifting track laterally, or raising it vertically.



The four foot Crusher in the Radum Plant.

This machine and one man takes the place of a large labor gang when shifting track.

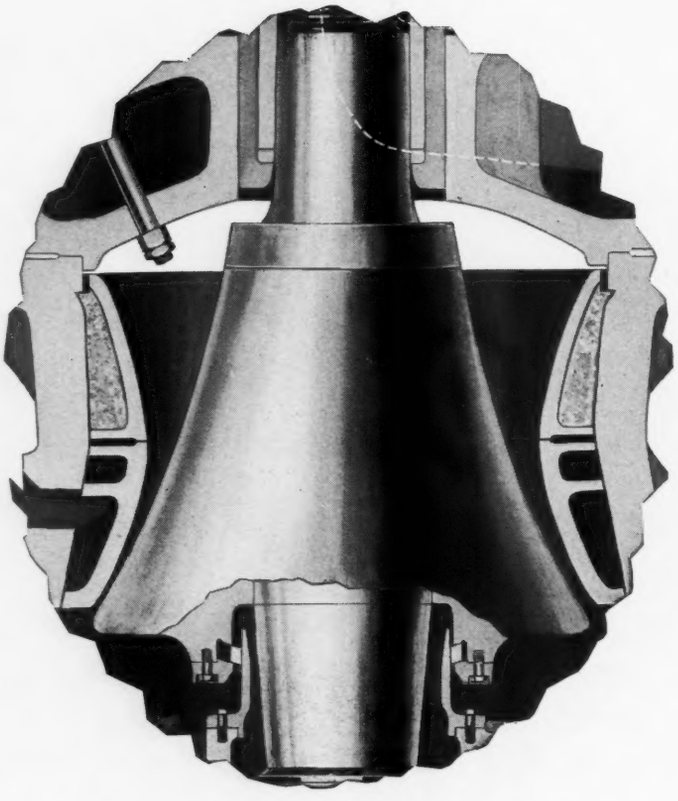
## NORDBERG MFG. CO. MILWAUKEE WISCONSIN

NEW YORK CITY, 51 E. 42nd St. LOS ANGELES, CAL., 1462 Stanley Ave.

OTHER NORDBERG PRODUCTS

Mine Hoists — Underground Shovels — Compressors
Blowing Engines — Diesel Engines — Steam Engines
Railway Track Equipment — Special Machinery

# ATTENTION, PLEASE!



## TRAYLOR
### NON-CHOKING
## HEAD
### AND
## CONCAVES

**Pat. Dec. 15, 1931**
**No. 1,837,102**

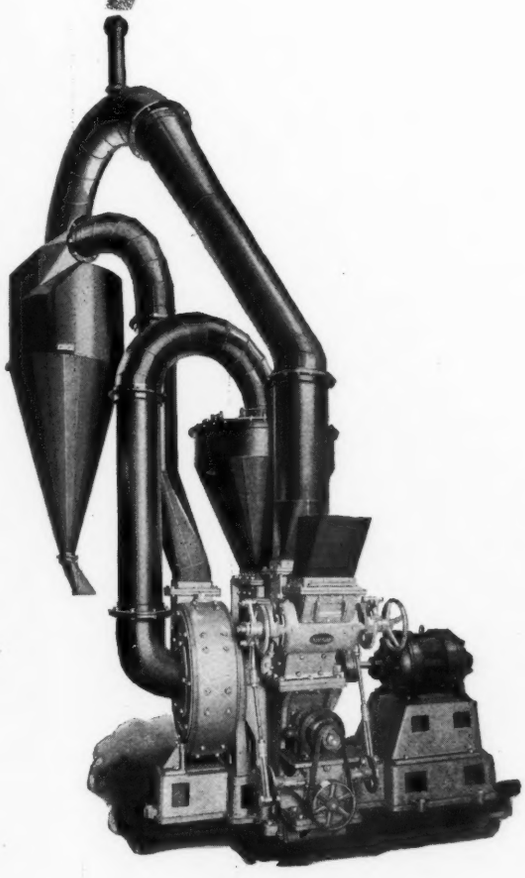
In connection with certain types of non-choking crushers, we call the attention of the public to our patent 1,837,102 issued December 15, 1931 relating to crushers of this type. We intend to enforce our rights under said patent against all manufacturers and users of stone crushers containing the features covered by said patent and to prosecute all infringers of said patent.

**TRAYLOR ENGINEERING & MANUFACTURING CO.**
**ALLENTOWN, PENNSYLVANIA, U.S.A.**

| New York City | Chicago | Los Angeles | Seattle | Salt Lake City |
|---|---|---|---|---|
| 30 Church St. | No. 1 La Salle St. Room 2131 | 908 Chester Williams Bldg. | 815 Alaska Bldg. | 101 W. 2nd So. St. |

Timmins, Ontario, Canada—Moore Block

# Fine pulverizing *plus* simultaneous air drying —with the IMP MILL



**HARD-TO-DRY materials, like diatomaceous earth, can be fed direct to the Raymond IMP MILL—then ground, dried, separated and delivered to the collector in one automatic, dustless operation.**

**This is the only practicable method of handling porous earths of high moisture content, according to manufacturers who have replaced their former equipment with Raymond IMP MILL installations.**

**They report a combination of economies which bring their production costs down to the lowest levels ever obtained:**

1. **Separate dryers and auxiliary conveyors or elevators are eliminated.**
2. **One machine does the work of multiple units thus saving labor and maintenance.**
3. **The process is greatly accelerated resulting in an increase in plant capacity and a decrease in operating costs.**

**The IMP MILL is built for hard jobs, and it has a wide range of specialized applications in the rock products industry. For difficult drying operations, it may be equipped with special heaters. The temperature in the system may be held as high as 212° F., for rapid evaporation of moisture. It may also be used as a direct firing unit for powdered coal plants.**

**If you have any pulverizing operation that cannot be accomplished satisfactorily with your present methods, it will pay you to inquire into the possibilities of the IMP MILL.**

**Write for your copy of the Raymond PULVERIZER CATALOG which gives description and applications of the IMP MILL.**

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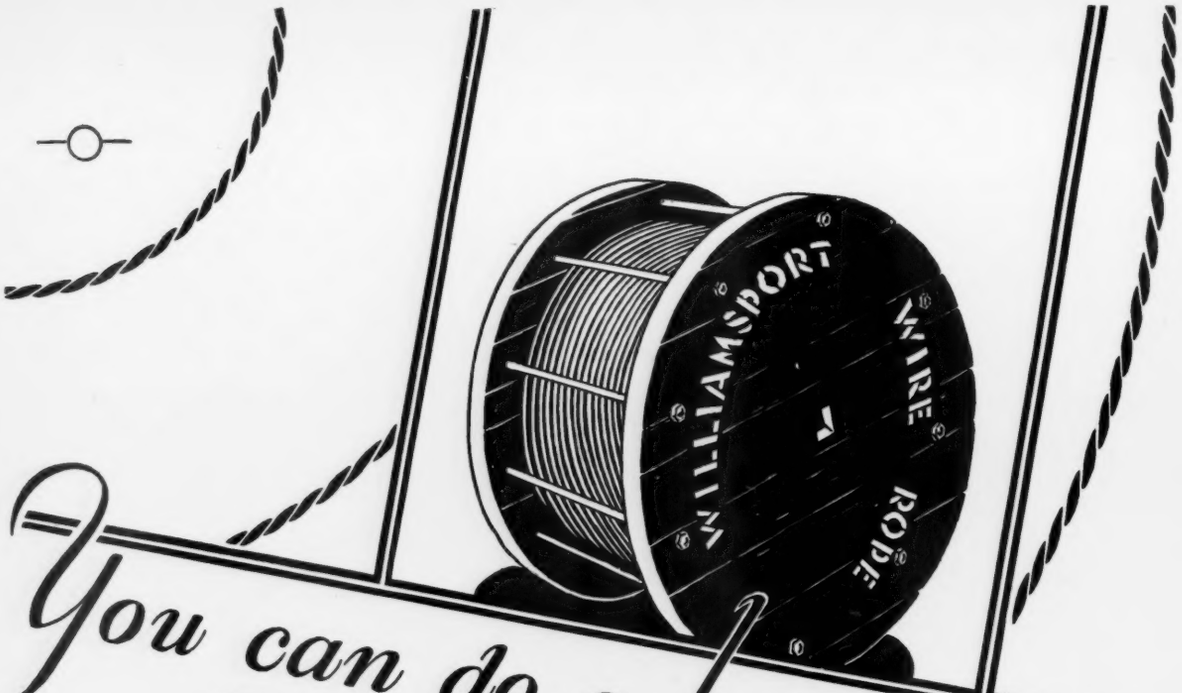


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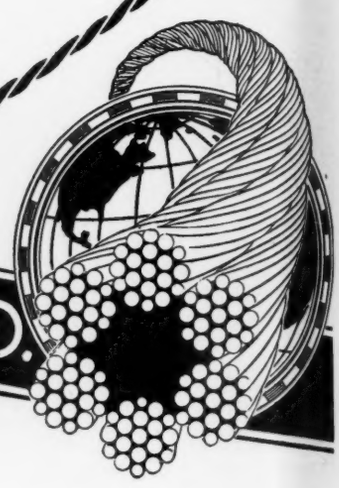
**We are building wire rope for every specific need and you will find Williamsport far advanced in wire rope manufacture. Send us your next inquiry and note the difference in the way we do things.**



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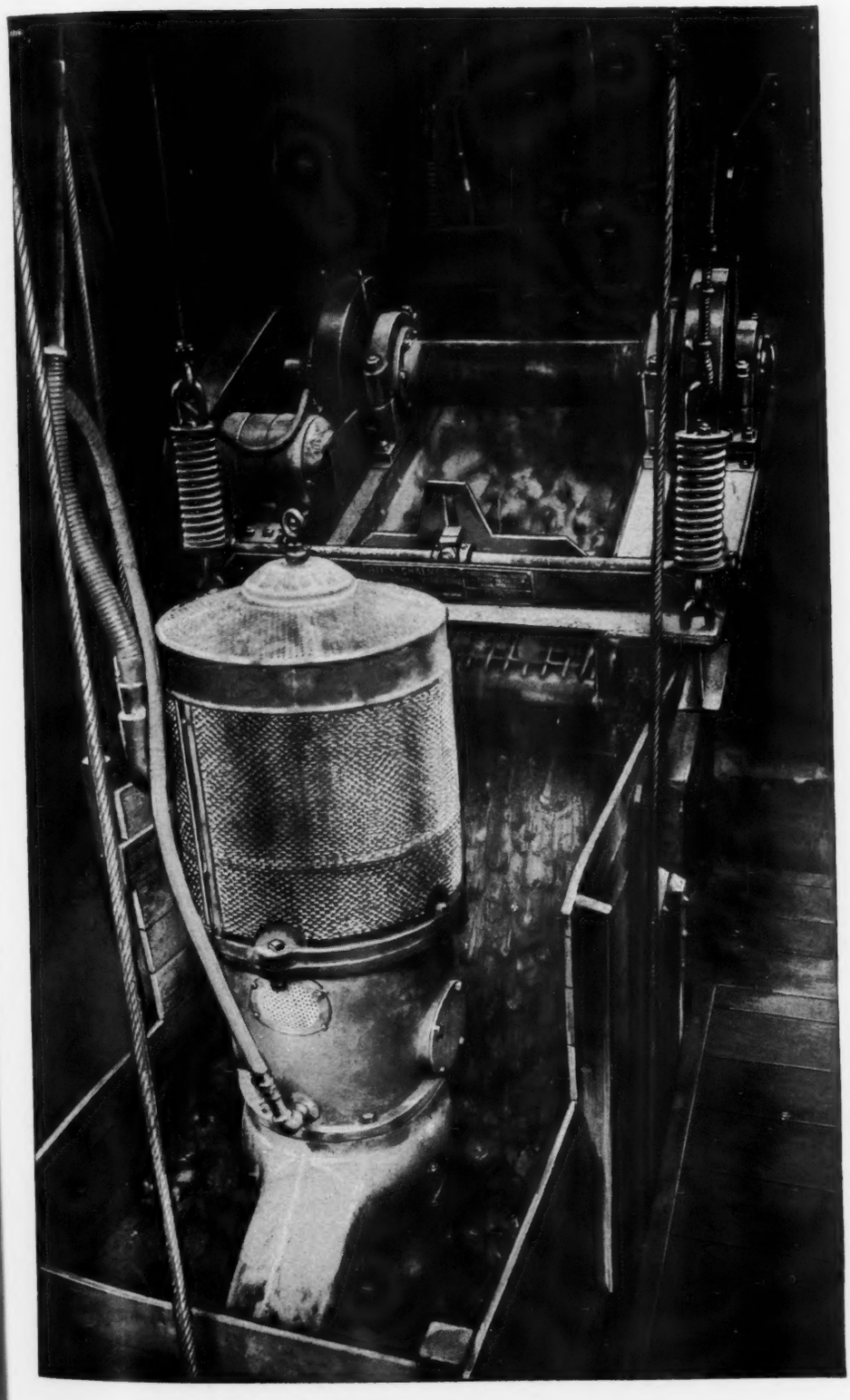

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Allis-Chalmers products for the crushing, screening or washing plant are briefly described in Leaflet 2144. We would like to send you a copy.

◈◈◈

*The Allis-Chalmers 27" Gyratory Crusher, Vibrating Screen and Newhouse Crusher shown here are operating in the plant of the Francey Stone Company, Milwaukee.*

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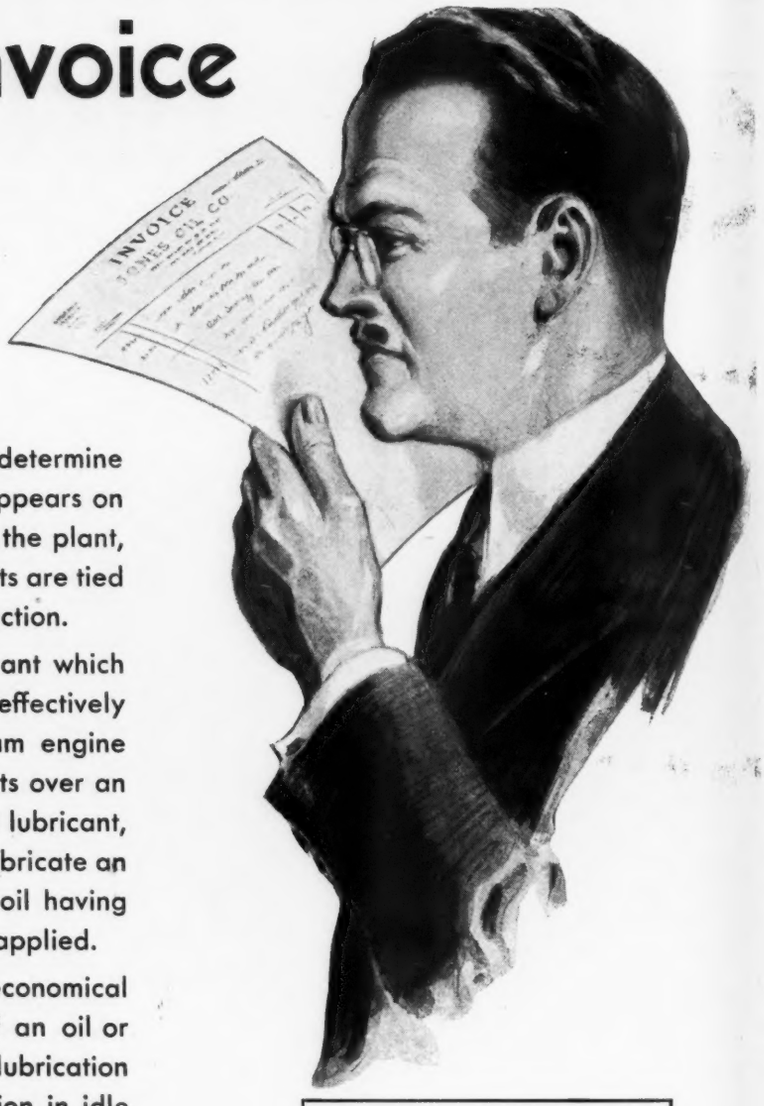
**Allis-Chalmers Mfg. Co.**
**Milwaukee, Wis.**

# ALLIS-CHALMERS

# The True Cost of Lubrication is not on the invoice




ONLY one of the eight factors which determine the actual and final cost of lubrication appears on the invoice. The other seven are found in the plant, for it has been proved that lubrication costs are tied up inseparably with operation and production.

Regardless of purchase price, a lubricant which can perform the extremely difficult task of effectively lubricating the valves of a Corliss steam engine will show large savings in lubrication costs over an oil that is not efficient. The highest priced lubricant, lacking certain characteristics, may not lubricate an electric motor as effectively as another oil having the proper qualities and being correctly applied.

There is much more to effective, economical lubrication than the quality or price of an oil or grease. Rightfully included in reckoning lubrication costs are savings resulting from reduction in idle machine hours through better lubrication. Likewise, savings in power, in material and labor costs of repairing equipment should be taken into consideration. Often, to determine just what costs should be charged to lubrication and to effect savings which may be possible, the training of a lubrication engineer is required.

You can get this training and knowledge working for you by calling in a Standard Oil Lubrication Engineer. He may be able to render valuable assistance to you in obtaining more effective and economical lubrication. No charge, of course, for this service.

STANDARD OIL COMPANY
(INDIANA)
910 South Michigan Avenue Chicago, Illinois

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## Monographs on Lubrication

Each month the Standard Oil Company (Indiana) publishes a technical monograph on the lubrication of some particular type of equipment.

The first monograph, published in April was entitled "Reducing Lubrication Costs." The second monograph being published this month, is "Lubricating the Corliss Valve Steam Engine." A copy of any or all monographs will be sent to you at your request.

VOLUME 24 NUMBER 3

Pit and Quarry

With which is consolidated

CEMENT-MILL & QUARRY

CHICAGO, MAY 4, 1932

## "Cut Prices or Lose Business", Is Order

### WISCONSIN ISSUES ULTIMATUM

Another example of the far-reaching and disastrous effects of price cutting developed in Wisconsin during the past few weeks when the state highway commission issued an ultimatum to cement companies that they must meet the low prices at which contracts were made in Illinois some time ago or lose the business.

Late last November the Wisconsin commission let contracts for 1,150,000 bbl. to a number of producers, among them the Manitowoc Portland Cement Co., of Manitowoc, Wis., the only plant in the state which received an order for 425,000 bbl.

Early in January, the Illinois highways department awarded contracts for 5,000,000 bbl. for road work this year. The large quantity attracted every bidder in the Middle West and, as a result, a price war developed, with Illinois getting its cement at the lowest figure in history.

One of the successful Illinois bidders, which had also obtained a contract to supply part of Wisconsin's needs, immediately notified the Wisconsin highway commission that it would fill its Wisconsin requirements on the basis of the Illinois bid. The Wisconsin commission then began action to obtain like adjustments from the rest of the cement companies which had been awarded contracts at prices higher than in Illinois.

Thomas J. Pattison, chairman of the Wisconsin highway commission, has announced that the first construction of the season will use cement supplied by the company that volunteered to supply the material at the lower price and that, unless the remainder of the Wisconsin bidders lowered their prices accordingly, the state would order the cement purchased through the road-builders themselves.

Because the price the state asks is far below the cost of manufacturing, the Manitowoc plant will be forced to close, it is said. The company has been relying upon fulfilling the state order for 425,000 bbl. and will refuse to comply with the ultimatum, it is reported, contending that it will suffer less by closing down than by selling its produce for less money than it costs to produce it.

In reply to a query by PIT AND QUARRY as to whether the Wisconsin highway commission believed it advisable to cripple the cement industry by insisting on prices that do not allow a manufacturing profit, Chairman Pattison replied:

"We have no desire on our part to bring about a condition where prices would be reduced to such a low level that there would not be a profit and our action of last November in taking bids for cement would indicate that we were satisfied with the price. However, when the cement industries themselves bid a much lower price in a neighboring state, we feel that we are justified in asking them to extend a like consideration in Wisconsin.

"If there had been one company bidding lower, we would not expect them to give us that consideration, but where there are a number who do participate in the lower prices, we think we are justified in the position we are taking."

## $125,000 Ballast Orders Awarded by Lackawanna

Orders for 125,000 tons of crushed-stone for ballast have been placed with producers along the lines of the Lackawanna Railroad, according to advices from the company's offices.

The material is expected to take care of the line's needs during the present year.

Price revisions were announced by leading building-material dealers in Chicago late in April. In most cases advances were made. Portland cement in both cloth and paper bags is up 10 c. Aggregates are increased about 50 c. per cu. yd. Bulk lime is up 10 c. a ton. Mason's hydrate is down $2.

The new retail price on Portland cement in cloth is $2.10; in paper, $1.85. Gravel No. 8 and No. 9, torpedo sand and crushed stone, are quoted at $2.25 a cu. yd.; screenings at $2; lake sand, $2.15; bank sand, $2. Bulk lime is selling at $13.50; Mason's hydrate at $14, and plaster lime at $15.

## Construction Gain in Second Quarter Seen

### 5% TO 15% RISE INDICATED

Reporting a construction contract volume of $286,078,700 for the first quarter of 1932 in the 37 states east of the Rockies, F. W. Dodge Corp. foresees a second quarter gain over this of from 5 to 15 per cent. in general construction. Expectations are that residential building will show a gain which will range from 10 to 20 per cent. over the figures for the first quarter.

Construction undertakings during March showed an expansion of about 26 per cent. as compared with February. The value of March contracts, however, was only about 30 per cent. of that reported for March, 1931. Of the total of $112,234,500 in new awards reported during the month in the thirty-seven states east of the Rockies, $33,208,600 was in residential building; $49,172,400 was in non-residential building; and $29,853,500 was in public works and utilities.

Territorial showings in new March contracts once again placed the Middle Atlantic territory ahead of the Metropolitan New York area with $20,902,600 as the Middle Atlantic total, comparing with $16,840,300 in Metropolitan New York. The Pittsburgh district was next in line with its total of $11,831,900; and New England was fourth in order with $10,071,400 reported during the month.

## Alabama Quarrying Firm Erects New Lime Plant

A new lime plant is being built in Shelby County, Alabama, by the Alabaster Stone Co., headed by George Scott. The plant is at Scotrock, Ala., on the main line of the L. & N. Railroad between Birmingham and Montgomery. For several years the company has operated a quarry and it was recently decided to go back into the lime business, with which Mr. Scott had been identified for many years.

The new plant will have two kilns and a hydrating unit. The hydrator has been erected and work is now in progress on the foundation for the two kilns. The steel frame for a building is also in place.

## Cement Plants Open; Expect Small Demand

### GOOD VOLUME IN NORTHWEST

Arrival of spring with its attendant revival of road building has brought increased activity to many of the country's Portland-cement plants. Production on a fairly steady, though necessarily curtailed basis is in prospect for most of the mills for several months.

The Catskill, N. Y., plants of the Alpha Portland Cement Co. and North American Cement Corp. have again resumed operation and the rate of production is said to be dependent upon whether or not the New York legislature would reconsider its recent action which cut the state road-building budget several millions of dollars.

A run of six or seven months is in prospect at the Boettcher, Colo., plant of the Colorado Portland Cement Co., according to officials, following the recent reopening of that operation.

More than 60 men were recalled to the Port Huron, Mich., mill of the Peerless Cement Corp. by Albert Oesterle, superintendent, a few weeks ago. Whether the plant will operate throughout the season is undetermined, it was said, due to the slowness with which highway contracts are being placed.

Normal volume of business in Washington and southern Idaho will keep production on a balanced scale through the summer, Eugene Enloe, president of the Idaho Portland Cement Co., declared with the recent reopening of the plant at Inkom, Ida.

All four kilns have been fired at the Petoskey Portland Cement Co. plant at Petoskey, Mich. About 175 men are at work in the quarry and about the plant. The company's self-unloading carrier *J. B. John* has been overhauled and is ready for service transporting bulk cement over the Great Lakes.

## Lower Freight Rates on Cement Urged at Parley

A lowering of freight rates on shipments of cement, due to competition of motor-truck lines, was suggested by railroad freight managers and traffic managers from cement plants in the middle west, following a meeting at Chicago recently. The meeting was called by Eugene Morris, chairman of the Central Freight Assn. Unregulated charges of the trucking companies are taking the business from the railroads, Mr. Morris said.

## Road Builders Meet in Session at Washington

The annual meeting of the American Road Builders' Assn. was held in Washington, D. C., on April 28 and 29.

Continuation of road and street programs of construction and maintenance on a scale that will satisfy the demands of traffic was the chief subject of discussion. Another pressing problem considered was the danger of the diversion of highway funds derived from gasoline taxes to purposes other than road and street construction and maintenance.

Results of committee work during the past year were reviewed and new subjects examined and approved. Meetings were held of the old and incoming boards of directors of the association and also of the city and county divisions.

The president's reception on April 28 attracted highway officials, manufacturers, contractors and other road builders from all parts of the country. The reception was in honor of W. R. Smith, president of the American Road Builders' Assn. Mr. Smith is also president of the Lane Construction Co., Meriden, Conn.

## New Stone Plant Ready for Operation Shortly

With a rated capacity of 1,500 tons of material per day, the new crushed-stone plant of Edward Johnson & Sons at Tujunga, Cal., is practically complete and test runs have been made preparatory to steady operation.

In an attempt to eliminate the dust nuisance in crushing and screening material, all stone is to be crushed and screened wet.

## Complete Electrification of Gravel Plant on Gulf

Electrification of the gravel-dredging plant of the Handsboro Gravel Co. of Biloxi, Miss., has been made possible following the installation by the Mississippi Power Co. of a transformer station near the company's operations on Bayou Bernard. A 180-hp. motor has been installed to operate the 1,800-gal.-per-min. dredge pump.

## Pacific Coast Sulphur Plant Damaged by Fire

Fire caused an estimated loss of $250,000 at the Oakland, Cal., plant of Western Sulphur Industries, Inc., recently. Thousands of tons of raw sulphur, together with two of the company's five main plant buildings, were destroyed.

Rebuilding of the burned buildings is already in progress, according to A. C. Palmer, manager.

## Iowa Gravel & Fuel Co. Announces Dissolution

The Iowa Gravel & Fuel Co., at one time operating one of the largest Mississippi River dredging plants for the production of sand and gravel, has been dissolved, according to an official announcement signed by F. M. Wunderlich, president, and D. J. Stribley, secretary.

## Attempt to Rule Out Small Roadside Pits

### INDIANA FIRMS MAKE APPEAL

An attempt to remove "fly-by-night" sand, gravel and crushed-stone producers from competition with established concerns in providing material for state road contractors in Indiana was made by established firms and railroad men April 20. The group appeared before the Indiana highway commission and asked the commissioners to make a rule that no contracts be approved unless the aggregate bidder is established in business before his bids are taken on the road project upon which he is a bidder.

The effect of such a ruling would be to eliminate individuals and concerns which enter the aggregate business only to provide material for one or two road projects. Such companies, it is said, open new pits in the vicinity of the road projects and then bid below prices which the established companies are able to make.

Chelsey Gray, of the Indianapolis plant of the American Aggregates Co. and a former chief engineer of the highway commission, told the commissioners that the state receives no benefit from the lower prices quoted by the companies in question. The only person who profits is the road contractor, who has made his bid on price quotations from established companies. He said the established companies have a capital investment in Indiana of more than $15,000,000 and employ more than 15,000 persons. Representatives of the Pennsylvania and Big Four Railroads were also present and said that lower freight rates would be worked out for the stone and gravel shippers. Each shipment would have to be regarded as a "special case," they said, as they could not establish any general reduction.

Mr. Gray declared that established companies had lost the sale of about 300,000 tons of materials to companies which had sprung up for single road projects since the first of the year.

The commissioners took the complaint under advisement. Governor Harry G. Leslie attended the meeting.

## Michigan State Cement Mill Still Heavy Loser

Michigan state legislators have again renewed their efforts to sell or abandon the cement plant operated by convict labor at Chelsea, Mich. Even in good times the plant operated at a loss, it was pointed out, and the operation of late has become a considerable drain on the state's funds.

Cement now being sold by the state at the plant at 55 c. per bbl. cost the state $1.40 to produce, even with prison labor, it was brought out.

## Talc-Refining Plant Operates in Georgia

ELECTRO PROCESS EMPLOYED

A new plant for refining low-grade talc rock by a recently developed electro-chemical process has been established at Chatsworth, Ga., by the Moss Chemical Co., headed by Wade Moss, Jr., of Atlanta, nationally known chemist. The new process, invented by Mr. Moss and associates, is claimed to produce a white, fluffy talc, equal in quality to the finest imported Italian talc, now extensively used in the manufacture of cosmetics and other products requiring such material. The Chatsworth plant, in the mountains near the Tennessee state line, is said to be capable of producing 60 tons of the finished product weekly. At present the plant is operating on an experimental basis, with commercial production expected to start in the near future.

The method of refining the talc is based on chemical and electrical processes, the rock first being ground to extreme fineness and "blunged" or mixed with water, after which sand and grit are removed by centrifugal separation. Further refining is accomplished by treating the mixture with chemicals and by passing a direct electric current through it. Finally it is filtered and only pure talc remains. Impurities found in the Georgia deposits include iron, nickel, lime, calcium chloride, calcium carbonate, magnesium oxide and iron oxide.

The industry was brought to Georgia chiefly as a result of surveys made by the industrial department of the Georgia Power Co., Atlanta, engineers of the utilities company bringing to the attention of the Moss interests possible savings in transportation costs by locating a plant near the mines. A further inducement was an abundant supply of low-priced electric power. Georgia Power Co. engineers acted in an advisory capacity in the selection and installation of electrical equipment.

General offices of the Moss company are at Dalton, Ga.

## Install 600-Ft. Conveyor at Indiana Gravel Plant

A 600-ft. field conveyor, purchased from the Robins Conveying Belt Co., has been placed in service at the pits of the Northern Indiana Sand & Gravel Co. at Wolcottville, Ind. A 30-in. belt is employed. The main offices of the company are located at Fort Wayne. Fred W. Tielker is president.

## Road-Building Program Will Determine Output

The five cement mills in the Birmingham district are marking time, pending the outcome of highway construction programs over the South. Louisiana's program alone would insure operation from six to nine months, continuously. Stocks on hand are said to be adequate for repairs and general maintenance work. Should Alabama's road work go forward as planned indications are that the mills are in position to care for all orders from this source as well as those of other states. Operation at present is confined to keeping up the minimum for stocks in warehouses.

## Col. E. M. Young, Lehigh President, Passes Away

Col. E. M. Young, long one of the outstanding figures in the cement industry, died April 26 at his home in Allentown, Pa., after an illness of several months. Col. Young was a native of the Lehigh Valley region and was one of the organizers of the Lehigh Portland Cement Co., of which he was president at the time of his death. He was one of the prime movers behind

Col. E. M. Young.

the organization of the Portland Cement Assn. and was its first treasurer. After forming the Lehigh company in 1897, Col. Young became its secretary and treasurer, later becoming a vice-president. He ascended to the presidency in 1925.

Burial took place April 28 at Allentown.

## Alpha Cement Purchases Stern-Wheeled Tow-Boat

The tow-boat *Catherine D.* has been purchased by the Alpha Portland Cement Co. for service in transporting cement on the Illinois River from its plant at LaSalle, Ill. The vessel is of the stern-wheel type and is 74 ft. long with a beam of 16 ft.

Two steel barges were also purchased.

## Supplies Crushed Stone for Veterans' Hospital

The Florida Crushed Stone Co. has been awarded the contract for supplying crushed stone for the new Veterans' Hospital under construction at St. Petersburg, Fla.

## Build Stock-House at Universal Atlas Plant

INCREASES STORAGE CAPACITY

Improved service to eastern cement buyers will result from completion of the 190,000-bbl. stock-house being built at the Hudson, N. Y., plant of the Universal Atlas Cement Co., a subsidiary of the United States Steel Corp. This new stock-house, together with the present tanks, will greatly enlarge the company's cement storage capacity and will expedite deliveries. The stock-house is being erected adjacent to the present storage tanks.

The structure will consist of a dozen bins, each of which will be 26 ft. in diameter and 100 ft. high. The bins will rest on a superstructure forming a basement in which screw-conveyors will be installed for use in withdrawing the cement. Reinforced concrete will be used throughout. The Gifford-Wood Construction Co. of Hudson is the designer and builder.

The substructure and foundation are now finished and the Universal Atlas company expects to have the stock-house in operation by the middle of June.

## Spend Nearly $500,000 on Utah Plaster Plant

Reconstruction of the plant of the Jumbo Plaster & Cement Company at Sigurd, Utah, involving an expenditure of nearly $500,000 is now under way, according to W. P. Payne, president and general manager. W. C. Stevenson, a San Francisco construction engineer, is supervising the work, which will include modern machinery for the manufacture of hard-wall plaster and white English cement. Each unit of machinery will be hydroelectrically powered. The plant was destroyed by fire several weeks ago.

## Leases Municipal Gravel Deposit On Royalty Plan

The Harmony Gravel Co. has leased a gravel deposit at Brazil, Ind., owned by the municipality and will shortly begin production. The plant is already nearing completion, according to press reports. The lease was made on a royalty basis, the town to receive 15 c. per cu. yd. on all material sold.

## Indiana Limestone Co. Adopts Five-Day Week

The Indiana Limestone Co. has gone on a five-day weekly schedule, according to an announcement from the company's main offices at Chicago. The five-day basis will not only be enforced in the quarries and plant in Indiana, but in the offices of the company as well.

# Editorial

## *Business Is Near the Turn*

INDICATIONS point to the beginning of the end. Prices are becoming steadier. We have often alleged—and we believe we have demonstrated so far as such a contention can be demonstrated—that a firming of prices would mark the beginning of the return of sanity to business and so prepare the way for the return of prosperity. We have asserted that buyers do not buy on a falling but on a rising market, that the incentive to buy for anything beyond immediate needs is absent as long as prices continue a downward trend, that the fear that prices may go lower stays the hand of every would-be purchaser. Experience in the last few years has shown us the truth of the halting tendency which falling prices cause; evidence that rising prices will improve business is not so easily obtained—certainly none of it is to be found in the cement industry, which seems to be a law (or an anarchy) to itself.

The practice of price-cutting—a custom to which every industry has become more or less inured—has other and worse effects than the temporary destruction of profit. It breaks down the price-value standards that have become established and recognized only through years of steadily mounting prices. Just as labor has with great difficulty and only through a long period of years won higher money recognition of its services, so has business, by steady improvement in quality and constant education of the consuming public in the values it had to offer, gradually raised not only the volume of sales but their price level. The merciless price wars of the last few years have wiped out the gains of decades in some industries, and buyers have been taught to look for distress prices and to believe that these will continue indefinitely.

In other directions price-cutting is even more disastrous. If it destroys the price standards that have required years for their erection, what of the cash surpluses which industry has set up in the years of comparative prosperity? We shall never know how many billions of dollars of stored cash—the surplus earnings of profitable business—have been frittered away to replenish the ravages of absurd price concessions—the losses of profitless business. Surely no sane business man will assert that the most conspicuous achievement of business has been its ability to build up in good times cash surpluses to carry it part of the way through bad times. It would have been much more to the credit of business had it devised means for preventing the occurrences of such catastrophes as have befallen business at times like these. It would likewise be much more laudable if business were able to contrive a way to extricate itself from the present welter. But business has done neither; seemingly it has been content to drift, leaving the solution—if there is one—and the duty of finding it to someone else.

Prices are becoming firmer in many lines. There has been a noticeable stiffening in wholesale prices in recent weeks and the tendency shows no signs of relaxing. The very fact that fluctuations are being held within narrower limits shows the ability of manufacturers of all kinds to control a situation that they have been accustomed to regard as beyond their management. Buyers of wholesale merchandise are no longer able to make their own prices and terms as easily as in the recent past. Manufacturers are learning that distress prices, like a narcotic, provide only a temporary easing, which is soon followed by greater distress that must be relieved by a sedative that becomes less and less effective as it is more and more employed. In the cotton industry, as George A. Sloan, president of the Cotton Textile Institute, recently showed, cotton prices have been more stable in recent months than those of many other raw materials, and raw-cotton prices are materially higher than the level of last year. With inventories reduced and operating schedules more uniform and regular, there are fewer temptations—that is to say, fewer assignable plausible reasons—to cut prices below profitable levels. Our own industries, as reported elsewhere in these pages, exhibit the same stiffening tendency.

The fact that the recognition of price-cutting as an evil is becoming more general is the step that naturally precedes any general movement to stiffen prices. Without conviction there can be no widespread action. Leaders in various industries are becoming more outspoken in their denunciation of price-cutting, and, what is more important, in many cases they are themselves adopting the practice they advocate. As long as a proposed remedy is recommended only for "the other fellow" it is not likely to attain popularity. What is needed is a few leaders in every industry who have the courage to adopt the measures which are necessary for rehabilitation and which they are so ready to prescribe for their competitors. Group meetings at which manufacturers agree to conduct their businesses in a sane manner are splendid gestures in the direction of stabilization, but too often they express only a hope and not a determination.

In our own industries the cement branch has presented what is perhaps the most striking and absurd example of price-cutting, the fruits of which—as evidenced by the Wisconsin situation described elsewhere in this issue—have begun to ripen and are falling. With definite highway-programs adopted, with no alternative concrete-making material available, with no danger, therefore, of having its market lost to it through deferred or abandoned buying or the substitution of competitive materials, the cement industry has virtually broken its back by ridiculous price competition between many of its members. Men may defer the building of houses, office buildings and factory structures be-

cause of what they believe are exorbitant costs, but public agencies, such as the road-building bodies of the various states, are not actuated by any such economy scruples. Judged by common business standards, state highway departments constitute a "soft" market with their expenditures already authorized, their construction work planned, and almost complete freedom from supervision. To make price concessions to such buyers is not demanded on the grounds of wisdom or necessity, yet the cement industry has presented the unusual—and, to an outsider, the amusing—spectacle of sellers underbidding one another in a sellers' market. One may well shudder to think how it would comport itself in a buyers' market.

Happily, however, the cement industry remains unique in its pursuit of this practice. Price-cutting has, of course, been adopted extensively and expensively by other branches of the nonmetallic-mineral industries, but in no part of them has it been as violent, as destructive, or—in view of the fact that they, too, sell to the same "soft" sellers' market—any more necessary. Although within the conflict, these other branches have had either the good sense or the fortitude to withhold themselves from its worst practices, possibly because the destructive tendencies of those practices were so evident. The effects, too, now that they are becoming more apparent, are beginning to reveal the frightful havoc of unrestrained price warfare and are demonstrating the wisdom of those who were able, either as individual producers or as entire sections of our industries, to abstain from the fight that is draining the strength of the cement branch.

Prices are becoming firmer in other lines, and even in some sections of the nonmetallic-mineral industries, in spite of the price-cutting pace and price-cutting reputation established by some cement makers. This is the first hopeful sign in years. If it indicates a growing sentiment in favor of doing business at a profit, even if the volume be small, it marks what is, in our opinion, the beginning of the end of the present distress. Let this sentiment become general and much of the country's idle money will be tempted from its hiding places and business will be on a fair way toward recovery.

## *The Causes of Business Failures*

THE present times have been blamed for many things but probably for nothing so generally as for the prevalence of business failures. The fact that many business concerns have been unable to survive the trials of the present period has too often been attributed to the period rather than to the weaknesses that were inherent in the businesses themselves and which have been aggravated and made more significant by present conditions.

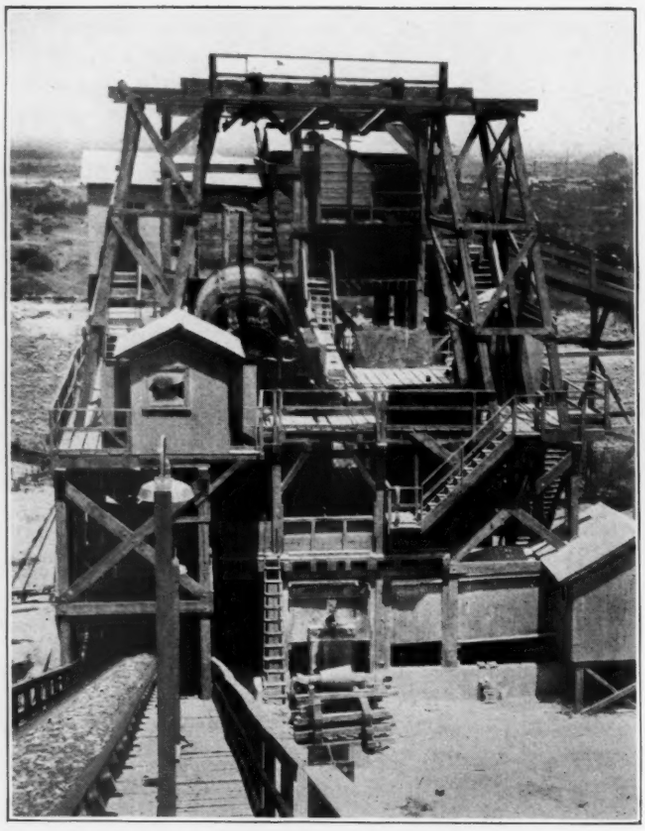
A study of the causes of business failures in New Jersey, made by the United States Department of Commerce, revealed the fact that "business depression" and "unemployment" were mentioned more often than any other as the reasons assigned by those who failed. However, investigation showed that in many if not most cases failure was due to conditions which had existed prior to the present period. "In many of the cases in which the debtor or the creditor attributed the failure to business depression the real cause was the inefficient business practices of the one who failed," says the report of the investigation. "When adverse business conditions came he failed, while his more efficient competitor was able to keep going."

Poor business conditions are the occasion rather than the cause of business failures in most cases. The prosperity which has been the common experience of the country between periods of slackened business has not been very exacting in its demands on business and, as a result, inefficiency has grown to astounding proportions. When sales are easily made there is no great need for either proficiency or efficiency, but in times like these the proficient and the efficient are the ones best fitted to survive. Incidentally, these are not the ones who blame failure on everything but the true cause. Years ago the commercial agencies discovered that most business failures were due to inexperience, inefficiency, and lack of suitability to the businesses in which the ones who failed were engaged. These are always the true causes of business failure, although they are never the causes assigned by the one who fails. This very inability or unwillingness to see the real causes of failure—a weakness due largely to the fact that the true causes are of a personal nature and tend to belittle one's estimate of his own powers—is in itself one of the chief causes of failure for it makes it difficult, if not impossible, for the one who fails to make a true appraisal of conditions. Self-criticism, one of the most difficult of tasks, is certainly not a quality of the one who fails.

The disclosed causes of business failures provide yet another reason for some form of control which can effectively determine who shall and who shall not embark in a given business. It is not a good plea for the unrestricted admission of anyone into any business to say that he risks only his own funds, for this is not true even of the head of a one-man concern. Every *entrepreneur* risks not only the capital of himself and his associates but also that of those who ship him merchandise or perform personal service for him on credit. The value of repossessed machinery which is returned for resale as used equipment has never been calculated, but it must be enormous, and it certainly lays a heavy toll on every branch of industry.

The costs of bankruptcy may be spread among many creditors but it adds materially to the cost of doing business and it affects all branches of trade. In a normal year the liabilities of commercial bankrupts approach $500,000,000 and in years of stress, such as 1921-1922 and 1930-1931, exceed $600,000,000. This represents just a part of the annual tax borne by business because of the prevalent belief that anyone has the right to experiment in any business regardless of the effects on business-at-large.

# Efficient Production Dominating Position

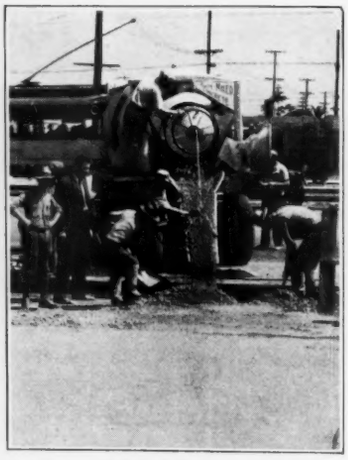


The Consolidated Rock Products Co.'s chief business is the production of aggregates. Here is the scalping and secondary crushing building at the Irwindale plant.

THE Consolidated Rock Products Co., Los Angeles, Cal., is the largest producer of sand and gravel in southern California and one of the two largest on the Pacific Coast. For this reason and because of the interesting methods used by this company in producing and delivering aggregates a description of the company's operations is of interest to all sand-and-gravel plant operators. The efficient and comprehensive system of truck delivery used by the company in serving an area of 2,500 sq. mi. in and around Los Angeles and the modern plant operated at Irwindale are especially worthy of description.

This company, as is evident from its name, was formed by a consolidation or merger of several smaller companies. The company now owns a total of 20 sand-and-gravel producing plants in and around the city. As is usually the case in a consolidation of this kind, the territories of some of the plants overlap to such an extent that a few of the more obsolete operations have been temporarily abandoned. The deposits, however, have been retained as a reserve source of supply.

Due to the decreased demand for aggregates during the past year only a few of the more economical and efficient plants are now in use. There is little difference in the quality of the deposit at these various plants so their location with respect to the market has been the other deciding factor. The company's Irwindale plant is the newest and most economical of them all and for this reason is now the chief source of supply. It is one of the best-designed plants on the coast and, together with its deposit, is admirably suited to the existing market demands.



*Left*—One of the mixer trucks discharging concrete on a street paving job in Los Angeles.

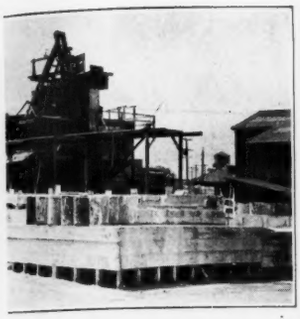
The Irwindale plant is located about 23 mi. east of downtown Los Angeles in the San Gabriel Valley. This district is widely known for its oranges, groves of which surround the plant property for miles in every direction. Its gravel deposits are also famous, as the San Gabriel wash is the chief source of aggregate supply in the Los Angeles district. The Consolidated Rock Products Co. also has a number of other large plants in this vicinity. E. M. Kirk is superintendent of the Irwindale plant.

The plant was designed by the Conveyor Co., Los Angeles, which also furnished most of the equipment. It was built early in 1928 by the California Materials Co. which was taken over by the Consumers Co. in the same year. Through a consolidation of most of the gravel producers in the Los Angeles district this plant became a part of the Consolidated Rock Products Co. when it was formed.

The plant is of concrete, steel and timber construction and all inclosures are of corrugated metal. The main screening plant superstructure and the framework of the field conveyor and main conveyors No. 6 and 7 are of structural steel. All other construction is of timber except as otherwise men-

The Irwindale sand-and-gravel plant.

# Plus Forceful Selling Aid Firm to Attain in Los Angeles Area



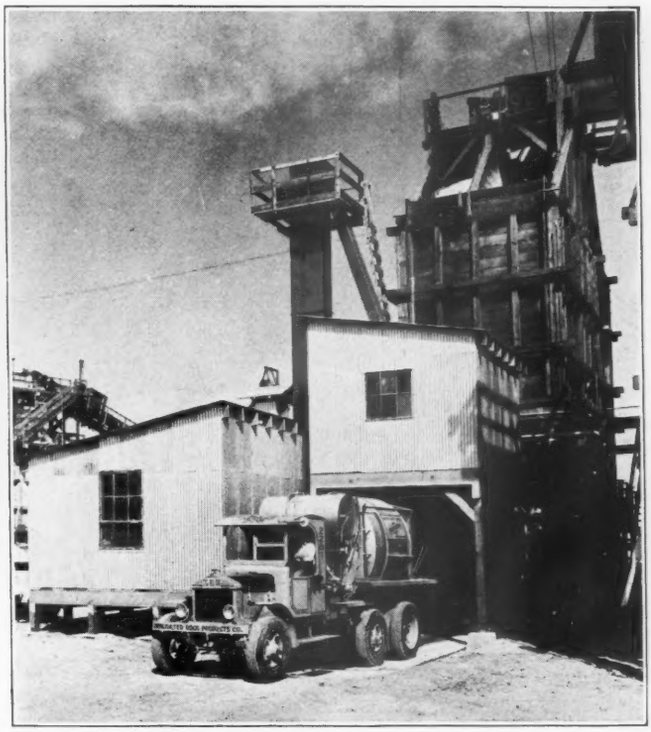
*Above*—Lime-mortar plant at Alameda St. *Right*—Electric shovel in the Irwindale pit.

tioned. Belt-conveyors are used for all mechanical handling of materials. It has a capacity of 400 tons per hr. of sand, gravel, and crushed gravel. At present four sizes of uncrushed gravel, four sizes of crushed gravel, and masons' and asphalt sands are produced. A feature of this plant is the separate handling of the regular gravel and the crushed gravel after the primary scalping has been done. Each is handled and screened separately but only the regular gravel is washed.

The deposit at the Irwindale plant is conceded to be one of the best in California. The proportion of gravel to sand is almost exactly balanced to the market demand, so that very little sand and pea gravel is wasted. This is rather unusual, as most plants in this vicinity waste large quantities of materials. The deposit averages about 40 per cent. sand with the remainder mostly commercial-sized gravel. A very small percentage of boulders up to 16-in. size are present and these are used for mattresses in the flood-control work which is always going on somewhere in this district. Gravel from 6-in. size down is screened and processed.

At present about 70 per cent. of the material produced is crushed gravel or "rock" as it is called in this district in sizes from 4 in. down to ¼ in. This

The Alameda St. cement warehouse.



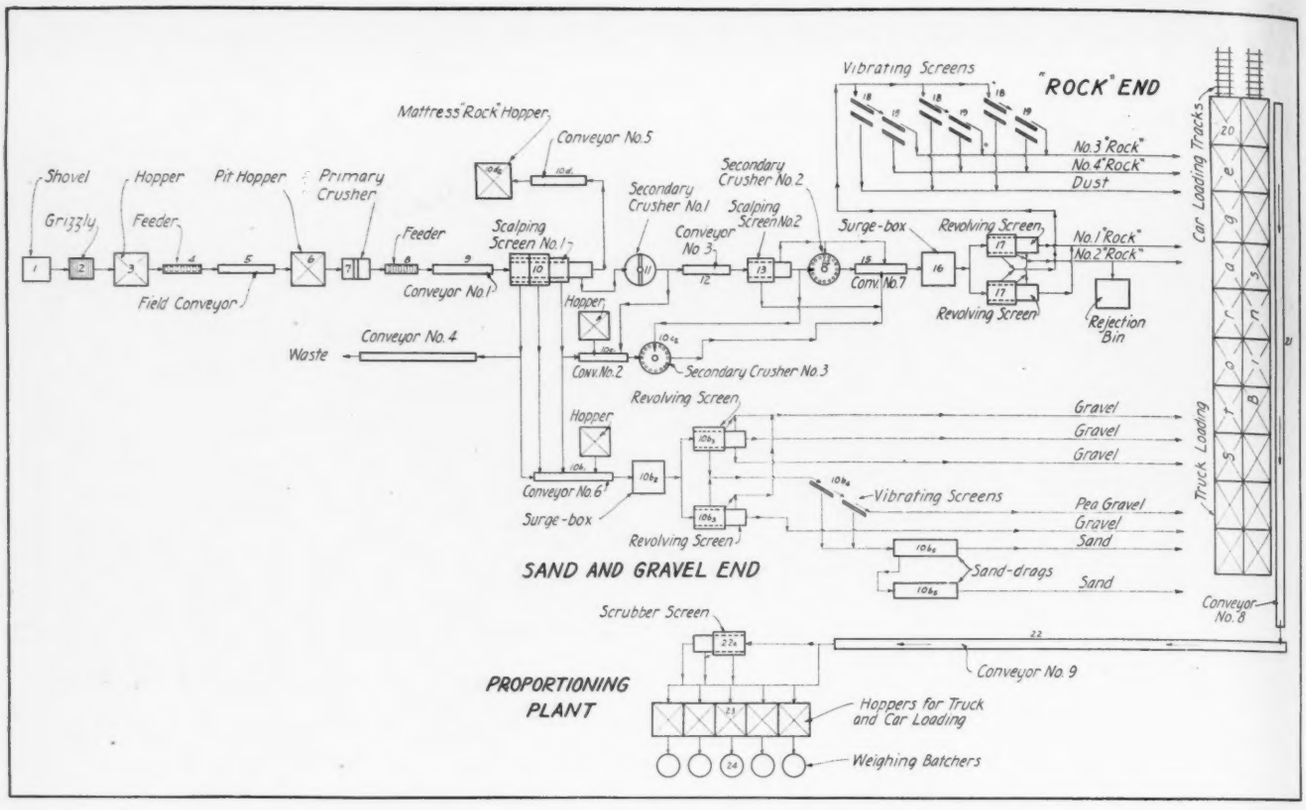
Pre-mixed concrete is another important part of Consolidated's complete service. Here one of the mixer trucks is being charged at the batching plant.

demand is due partly to the large amount of No. 4 rock being used at present for bituminous macadam and bituminous concrete highways in and around Los Angeles. The plant is so laid out that all gravel can be crushed if desired.

The company is at present working a property of 80 acres all which has been carefully tested. The overburden of sandy clay is very light and does not need to be removed. Although good gravel is known to exist to a depth of at least 300 ft. the pit is at present being worked to a 100-ft. depth. The gravel is well graded and compacted and stands in an almost vertical face. By slightly undercutting the face the gravel is caved down into piles from which it is easily handled by the shovel.

The material is loaded by a Bucyrus 80B electric shovel with a 2½-cu.yd. dipper and crawler treads into a 12-cu.yd. portable steel field hopper. This has a 24-in. rail grizzly which removes boulders too large for the primary crusher and is mounted on movable rails so that it can be moved easily by the shovel. A shuttle feeder discharges the material on the 42-in. field conveyor and is driven from the tail-pulley of the conveyor.

The field conveyor consists of 22-ft. steel sections which are easily moved by the shovel. The conveyor has been extended to a length of 750 ft. and is being revolved about its discharge end. When all available material has been reached with this conveyor, another field conveyor will be added and will rotate about the end of the first conveyor. The present field conveyor is driven by a 75-hp. Fairbanks-Morse electric motor.




**Flow-sheet of the Irwindale plant, Consolidated Rock Products Co.**

The last section of the field conveyor is inclined to discharge to a feed hopper in the permanent primary-crusher building where plant operations actually begin. The hopper feeds to the 36-in. by 48-in. Llewellyn Iron Works Blake-type jaw primary crusher. A plate feeder maintains an even feed to the 42-in. main belt-conveyor (No. 1) which takes the crushed material out of the pit to the primary-screening building. This conveyor operates on 650-ft. centers and at an inclination of 30 deg.

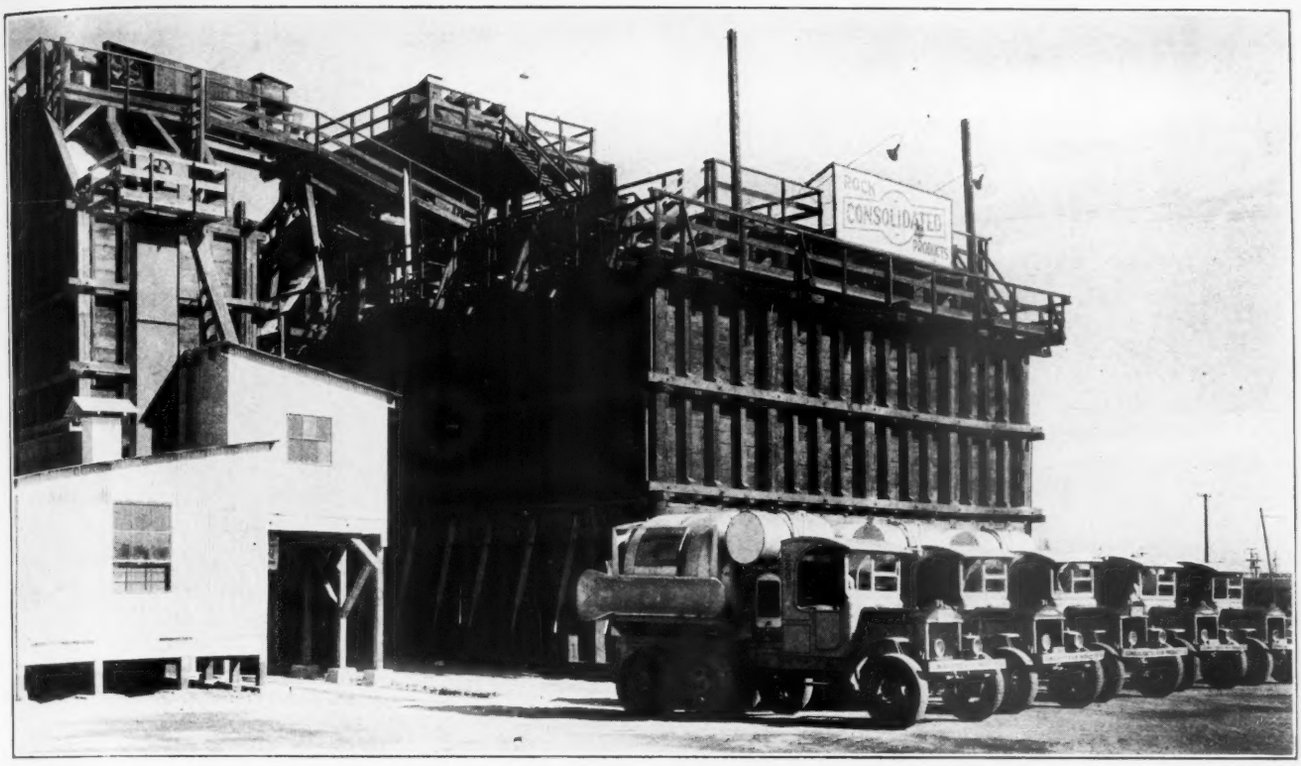
Conveyor No. 1 discharges to a Conveyor Co. triple-jacketed revolving scalping screen (No. 1), the main barrel of which is 6 ft. in diameter and 28 ft. long and has 6-in. perforations. The intermediate jacket is 8 ft. in diameter and 15 ft. long and has 2¾-in. round perforations. The outer jacket is 10 ft. in diameter and 13 ft. long. Four feet of this has 1$^{5}/_{16}$-in. perforations and the remainder is ¼-in. wire cloth. This produces five sizes of materials.

The ¼-in. minus material can be discharged either to a 24-in. horizontal belt-conveyor (No. 4) operating on 76-ft. centers for discharge back into a worked-out section of the pit, or to belt-conveyor No. 6 feeding to the gravel end of the main screening plant. The ¼-in. to 1$^{5}/_{16}$-in. material is discharged directly to conveyor No. 6. The material from 1$^{5}/_{16}$ in. to 2¾ in. in size can be discharged either to conveyor No. 6 or to conveyor No. 2 which feeds to the secondary-crushing building. The 2¾-in. to 6-in. material drops to a 14-in. Traylor Bulldog secondary crusher (No. 1) below the screen. This discharges to either conveyor No. 2 or No. 3 in the secondary-crushing plant as desired. The stone over 6 in. in size is diverted to conveyor No. 5. This is 24 in. wide, operates on 52-ft. centers, and feeds to a 30-ton steel hopper. This installation was recently made and is used for truck delivery of mattress stone.

Conveyor No. 2 is 36 in. wide, operates on 155-ft. centers, and discharges to a 5½-ft. Symons cone crusher (No. 2), which reduces the material and discharges it to conveyor No. 7. Conveyor No. 3 is 24 in. wide, operates on 135-ft. centers, and feeds to a 4-ft. by 16-ft. secondary scalping screen (No. 2), in the secondary-crusher building. This has 4-in. perforations on the main barrel and 1-in. on its outer jacket. The 1-in. minus material goes to conveyor No. 7 to the crushed-gravel end of the main-screening building. The 1-in. to 4-in. material goes either to a 4-ft. Symons cone crusher (No. 2) or directly to conveyor No. 7 as desired. The material over 4 in. in size can be fed to either cone crusher. The entire product of the secondary-crusher building is fed to belt-conveyor No. 7 which is 36 in. wide and operates on 317-ft. centers.

Provisions are made for the recirculation of stored or stock-piled material through the plant. Trucks can discharge to a small hopper over conveyor No. 2 or one over conveyor No. 6 for crushed rock or gravel.

Conveyor No. 6 carries the 2¾-in. minus or the 1$^{5}/_{16}$-in. minus material, as the case may be, to the gravel end of the main-screening building. This conveyor is 36 in. wide, operates on 313-ft. centers, and discharges to a surge-box which splits the stream of materials to two 4-ft. by 21-ft. revolving screens. Both have $^{5}/_{16}$-in. wire outer jackets. One has 1¼-in. perforations on the main barrel while




**Ready-mixed-concrete plant at the Alameda St. operations.**

**TABULAR ANALYSIS OF THE OPERATIONS AND EQUIPMENT OF CONSOLIDATED ROCK PRODUCTS CO. PLANT AT IRWINDALE, CAL**

*(The key numbers refer to the equipment shown on the accompanying flow-sheet.)*

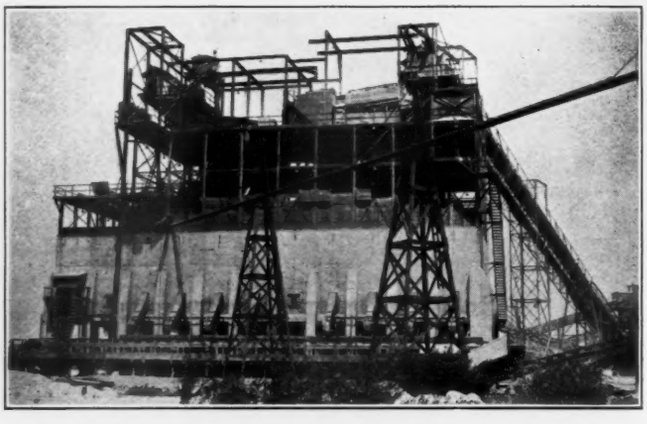
| Operation | Key | Equipment | Make | Model No., Size, Capacity or Type | Power Source | Power Transmission |
|---|---|---|---|---|---|---|
| Raw-material recovery | 1 | Shovel | Bucyrus | 80B, 2½-cu. yd., electric | | |
| | 2 | Grizzly | | 24-in. rail | | |
| | 3 | Portable field hopper | | 12-cu. yd., steel | | |
| | 4 | Feeder | Conveyor Co. | Shuttle | Conveyor tail-pulley | Chain |
| | 5 | Field conveyor | Link-Belt | 42-in., 750-ft. centers | 75-hp. F-M motor | |
| | 6 | Pit hopper | | | | |
| Primary crushing and scalping | 7 | Primary crusher | Llewellyn | 36-in. by 48-in., Blake | 200-hp. F-M motor | Belt |
| | 8 | Feeder | Conveyor Co. | Plate | | |
| | 9 | Belt-conveyor No. 1 | Conveyor Co. | 42-in., 650-ft. centers | 75-hp. G.E. motor | |
| | 10 | Scalping screen No. 1 (¼-in. minus to 10a or $10b_1$; ¼-in. to 1 5/16-in. to $10b_1$; troughs to $10b_1$ or $10c_1$; 2¾-in. to 6-in. to 11; over 6-in. to $10d_1$) | Conveyor Co. | 6-ft. by 28-ft., triple-jacketed, revolving | 10-hp. F-M motor | Belt |
| Secondary crushing and scalping | 11 | Secondary crusher No. 1 (optional to $10c_1$) | Traylor | 14-in. Bulldog gyratory | 75-hp. F-M motor | Belt |
| | 12 | Belt-conveyor No. 3 | Conveyor Co. | 24-in., 135-ft. centers | 10-hp. F-M motor | |
| | 13 | Scalping screen No. 2 (1-in. minus to 15; 1-in. to 4-in. to 14 or 15; over 4-in. to 14 or $10c_2$) | Conveyor Co. | 4-ft. by 16-ft. double-jacketed | 10-hp. F-M motor | Belt |
| | 14 | Secondary crusher No. 2 | Symons | 4-ft. cone | 100-hp. F-M motor | Direct |
| Waste sand | 10a | Conveyor No. 4 to waste | Conveyor Co. | 24-in., 26-ft. centers | 15-hp. Westinghouse | |
| Mattress stone | $10d_1$ | Belt-conveyor No. 5 | Conveyor Co. | 24-in., 52-ft. centers | 7½-hp. V.S. motor | |
| | $10d_2$ | Hopper | | 30-ton, steel | | |
| Tertiary crushing | $10c_1$ | Belt-conveyor No. 2 | | 36-in., 155-ft. centers | 10-hp. F-M motor | |
| | $10c_2$ | Secondary crusher No. 3 (to 15) | Symons | 5½-ft., cone | 150-hp. F-M motor | Direct |
| Stone screening | 15 | Belt-conveyor No. 7 | Conveyor Co. | 36-in., 317-ft. centers | 30-hp. F-M motor | |
| | 16 | Surge-box | | | | |
| | 17 | Revolving screens (2) (1¼-in. to 1¾-in. to storage; 1¾-in. plus to storage; 1¼-in. minus to 18) | Conveyor Co. | 4-ft. by 21-ft., double-jacketed | 15-hp. F-M motor | Gear |
| | 18 | Vibrating screens (3) | Hum-mer | Type V32, 4-ft. by 8-ft., double-deck | | |
| | 19 | Vibrating screens (3) | Hum-mer | Type V32, 4-ft. by 8-ft., double-deck | | |
| Gravel screening | $10b_1$ | Belt-conveyor No. 6 | Conveyor Co. | 36-in., 313-ft. centers | 40-hp. F-M motor | |
| | $10b_3$ | Surge-box | | | | |
| | $10b_4$ | Revolving screens (2) | Conveyor Co. | 4-ft. by 21-ft., double-jacketed | 15-hp. F-M motor | Gear |
| | $10b_4$ | Vibrating screens (2) | Hum-mer | Type V32, 4-ft. by 5-ft., single deck | | |
| | $10b_5$ | Sand-drag | Conveyor Co. | 5-ft. by 14-ft., rake | 15-hp. F-M motor | Gear |
| | $10b_6$ | Sand-drag | Conveyor Co. | 5-ft. by 14-ft., rake | 15-hp. F-M motor | Gear |
| Storage and mixing | 20 | Storage-bins (20) | | Concrete, 3,000-ton total capacity | | |
| | 21 | Belt-conveyor No. 8 | Conveyor Co. | 36-in., 119-ft. centers | 10-hp. F-M motor | |
| | 22 | Belt-conveyor No. 9 | Conveyor Co. | 36-in., 235-ft. centers | 50-hp. F-M motor | |
| Scrubbing | 22a | Revolving screen | Conveyor Co. | 5-ft. by 18-ft., double-jacketed | 10-hp. F-M motor | Belt |
| Storage, loading and batching | 23 | Storage-bins (5) | | 500-ton total capacity | | |
| | 24 | Weighing batchers (5) | Johnson | 9 to 27-cu. ft. capacity | | |

Looking down conveyor No. 1 into the pit, where the primary crusher is located.

the other has both 1¼-in. and 1¾-in. perforations.

With the exception of the fines, the other four sizes produced by these screens go directly to bins. The material through the 5/16-in. outer jackets drops to two 4-ft. by 5-ft. Hum-mer Type V-32 single-deck vibrating screens with ¼-in. by ¾-in. Tyler wire cloth. The material retained on these screens goes to storage as pea gravel. Both the revolving and vibrating screens have sprays which wash out any slight impurities or clay.

The water and sand passing through the vibrating screens are fed to two 5-ft. by 14-ft. rake-type sand-drags in series. These were made by the Western Pipe & Steel Co. to the design of the Con-



Storage-and-screening building from the south, showing chutes and the mixing conveyor.

veyor Co. and have a reciprocating-paddle action derived from an eccentric on their drive shafts. The two sizes of sand produced go to bin storage, and the waste water and silt are flumed to a distributing box from which they can be flumed to any of three sumps near the plant. Some of the water from these sumps seeps through the gravel underlying the plant site to the wells which furnish the fresh-water supply.

Conveyor No. 7 discharges to a surge-box on the "rock" end of the main-screening plant. This splits the stream of material to two 4-ft. by 21-ft. revolving screens, which have 1¾-in. and 1¼-in. perforations on their inner and outer jackets respectively. The 1¼-in. to 1¾-in. "rock" goes to a bin as No. 2 crushed rock, while the 1¾-in. plus material goes to a bin as No. 1 crushed rock or to a rejection bin from which it is carried by truck to the conveyor hoppers previously mentioned for recirculation through the plant.

The material under 1¼ in. from the revolving screens goes to a battery of six 4-ft. by 8-ft. Hummer Type V32 double-deck vibrating screens, arranged in three series of two screens each. The center series receives a part of the product of each of the two revolving screens by means of split chutes arranged to split the material three ways. These screens have 7/16-in.-mesh wire cloth on their top decks and 3/32-in. and ½-in. on their bottom decks. The material retained on the top decks of these screens goes to a bin as No. 3 crushed "rock." The 3/32-in. to ½-in. material goes to a bin as No. 4 crushed "rock." The 3/32-in. minus material goes to a dust bin.

The washing and screening building is a structural-steel superstructure mounted on the concrete storage-bins. The bin structure presents an attractive appearance because of its buttressed-column construction. It has two rows of ten 150-ton compartments each. One or more of these can be used for each size of material produced, depending on

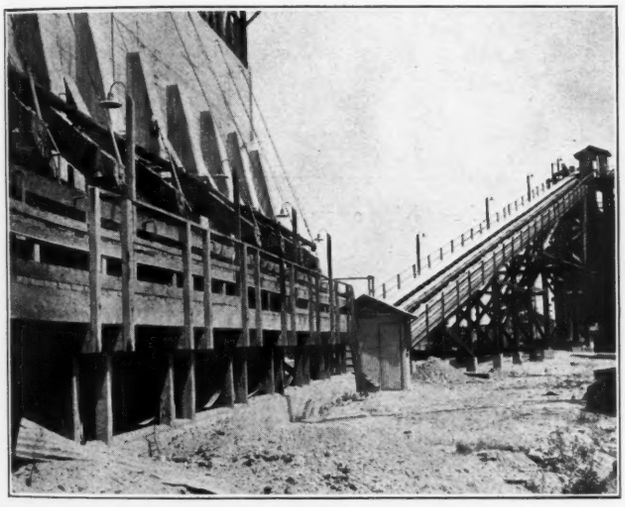
The primary jaw crusher in the pit.

the demand for it. Railroad cars are loaded on two tracks under the bins through bottom-discharge gates. Trucks are loaded from the bins on the north side of the plant through drop-chute gates which are riffled to retard the speed of the stone and to prevent breakage and wear. Trucks load under these chutes and then drive under a horizontal spray pipe with the truck bodies slightly tilted to allow most of the water to drain out. This serves the dual purpose of rerinsing the gravel or "rock" and making it dustless when handled on the job. The drippings from the trucks also settle the dust on the road leading into the plant.

Steel chutes discharge from the 10 bins on the south side of the building to a mixing belt-conveyor No. 8, which feeds to the proportioning plant for

loading out specially graded aggregates. These chutes have no gates but have a movable cross spout which can be raised or lowered to discharge to the belt-conveyor. The position of the cross spout controls the discharge from the main chute. When the spout is raised to its top position the flow of material is shut off and the rate of flow increases as the spout is lowered. The spout is raised and lowered by a cable attached to a hand lever on a quadrant below each chute. The lever is adjusted to any desired position by means of a steel pin which is inserted in one of the holes in this quadrant. When any special gradation is desired, the quadrants for each spout are set to their predetermined positions, resulting in an accurately-graded aggregate.

Conveyor No. 8 is 36 in. wide and operates on 119-ft. centers. It runs horizontally alongside the bins and discharges to inclined conveyor No. 9 to the top of the proportioning building. This conveyor is 36 in. wide and operates on 235-ft. centers



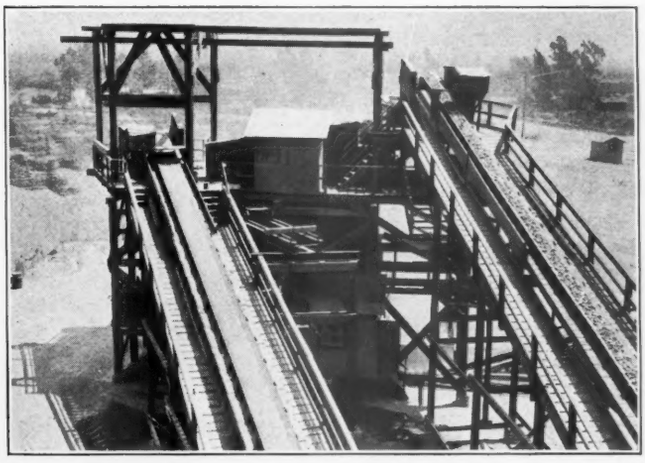
**The mixing conveyor is charged with stone from the bins and runs to the loading building in the background.**

and can discharge either directly into bins or to a 5-ft. by 18-ft. revolving scrubber screen. This has 1-in. and ⅛-in. perforations on its inner and outer jackets, respectively, and is used only for a final rewashing of the gravel. Any finer sizes are bypassed directly to the bins. The five bin compartments have a capacity of 100 tons each and are arranged in a single row. Cars are loaded through side gates and chutes and trucks are loaded under the bins through five Johnson weighing-batchers varying from 9 to 27 cu. ft. in capacity. This building is used mostly for batching various unmixed sizes of aggregates to trucks.

The fresh-water supply comes from two wells near the plant. The main well is 184 ft. deep and has a Layne & Bowler Corp. turbine-type 18-in. deep-well pump driven by an integral General Electric 250-hp. induction motor. This furnishes 900 gal. of water per min. at 100 lb. pressure at the top of the screening and washing building. A second pump-house contains a Layne & Bowler 14-in. pump which is of the same type and is driven by a 125-hp. General Electric motor. This well is 220 ft. deep and is used in an emergency or when a dry season has reduced the capacity of the main well.

About 100,000 tons of various sizes of materials is always kept in stock-piles. These materials are stored and rehandled by a P & H gasoline locomotive crane handling an Owens ¾-cu.yd. clam-shell bucket. A Northwest ¾-cu.yd. gasoline crawler shovel is also used for rehandling to cars or trucks for shipment. All yard switching is done with a Vulcan 45-ton steam locomotive. A wooden office building at the entrance to the property has a 20-ton Fairbanks dial truck-scale on one side and a 100-ton self-registering beam track-scale on the other side for weighing out all car-load shipments.

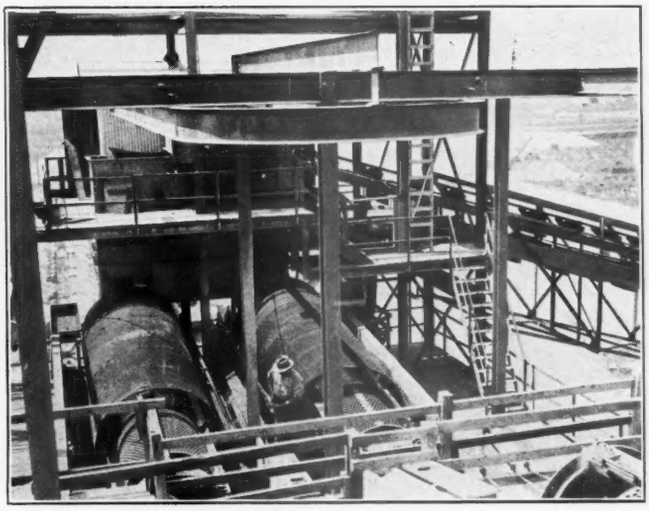
The plant belt-conveyors, feeders, revolving screens, sand-drags, bin-gates, and other miscella-



**Reduction-crushing department as viewed from the scalping building.**

neous equipment were furnished by the Conveyor Co., the field belt-conveyor by the Link-Belt Co. Pioneer conveyor belting is used almost exclusively. A Chisholm-Moore chain hoist on tracks over the primary crusher is used to handle repair parts.

Electricity is received from public-service wires at 10,500 v. and is reduced at the plant by outdoor transformers to 440 v. for plant use. Industrial Controller Co. switches are used throughout the plant. Direct-current for the Hum-mer vibrating



**The pair of revolving screens which size the gravel.**

screens is produced by a Tyler generator driven by a 7½-hp. General Electric motor. This unit is located in a small room on top of the screening building. With a few exceptions the electric motors used in this plant are Fairbanks-Morse machines.

The 20 plants owned by the company are supplemented by a number of storage bunkers in strategic locations in and around Los Angeles. All these bunkers are similar in size and design and were owned by the Union Rock Co. before the consolidation. All rail shipments are made direct from the plants, while truck deliveries are made from the plants or bunkers, depending on the economies involved. Materials are delivered to the bunkers by railway but can be made by truck in emergencies.

The Merrill Ave. bunker, located a few miles southeast of the main business center of Los Angeles is typical. Cars or trucks discharge to a hopper and the material is handled to the top of the bunker by a bucket-elevator. This discharges through a chute to a shuttle belt-conveyor which distributes to the four bin compartments, which have a total capacity of 3,500 tons. A 55-ton car load of gravel can be unloaded in 15 min.

All shipping from bunkers is by trucks and 14 can be loaded at one time in the two runways under the bins. Each bunker has four 3,000-lb. weighing-batchers for concrete aggregates. These are used separately for coarse, medium rock, fine rock, and sand. All the bunkers are of timber construction on concrete foundations and are Link-Belt equipped. Blaw-Knox and Bodinson weighing-batchers are used.

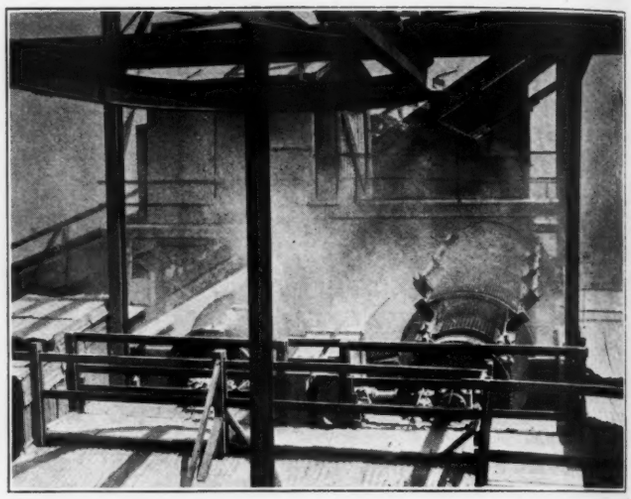
The Big T Plant in the San Fernando Valley is one of the important producing operations. This plant has an interesting loading arrangement. The five storage-bins have a total capacity of 1,500 tons and each one has three bottom-discharge sliding

H. D. Jumper, chief engineer and assistant production manager, at one of the quadrants controlling the discharge from bins to loading belt.

gates. In the truck-loading tunnel are four Bodinson 3,000-lb. weighing-batchers roller-mounted on rails so that they can be moved to any desired gate. One is used for the two sand bins and one for each of the three gravel bins. This plant has a capacity of 250 tons per hr.

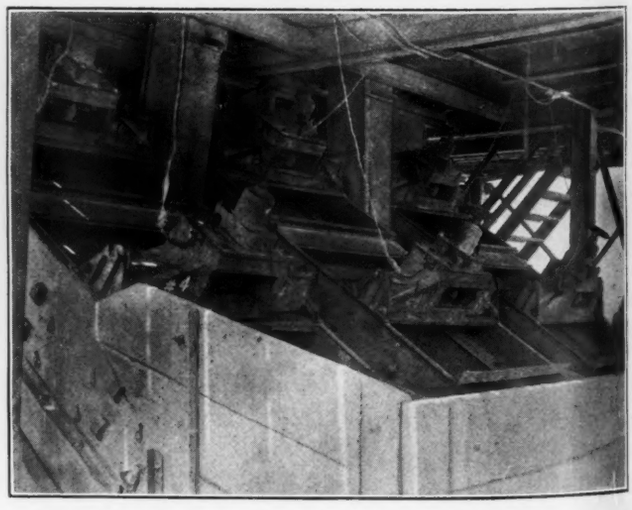
Another interesting operation is the Boulevard plant which has a capacity of 300 tons per hr. Gravel is handled in the pit by a field conveyor and recovered from storage-bins by a tunnel-conveyor system, such as is used in most of the plants. In addition to aggregates the company also handles lime and cement at its yards and operates a lime-mortar mixing plant at the Alameda yard.

When the merger forming the Consolidated



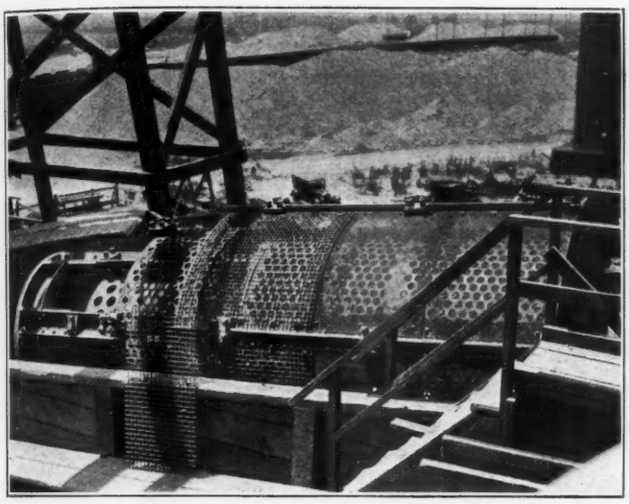
Pair of revolving screens sizing crushed stone.

Rocks Products Co. was made the company fell heir to the trucks used by the merged operators. The company now owns over 250 trucks of assorted makes, including the following: Fageol, General Motors, Pierce-Arrow, Federal, Mack, Autocar, and Moreland. To simplify the distributing system three division headquarters were established, each in the center of a group of plants. The Western Division headquarters is at the Valley yard in the San Fernando valley northwest of Los Angeles; the Eastern Division headquarters is at the El Monte yard east of Los Angeles; and the Central Division headquarters is in the southeastern part of metropolitan Los Angeles at the Alameda St. plant. Or-



The battery of six fine-sizing screens for crushed stone.

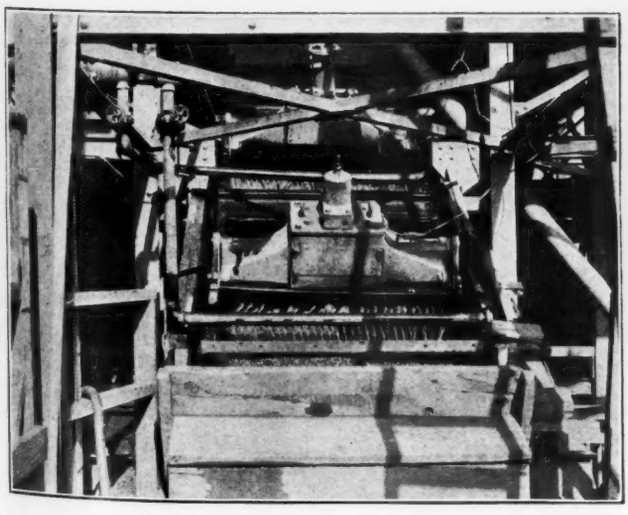
dinarily 100 trucks are kept at the Valley yard, 80 at the El Monte yard, and 50 at the Alameda yard. From these centers the trucks are assigned to the various plants and bunkers as needed. When one division is particularly busy, trucks are sent to it from the others. In addition to those mentioned above 15 trucks are regularly assigned to the Orange County plant and 5 to the Claremont plant, as these are outlying operations which could not be conveniently served from any of the yards. Each division has its own repair shops, where greasing,



A close view of the triple-jacketed scalping screen.

washing, and other maintenance are provided. The division headquarters are so located that the busiest section of the city can be served equally well from two of them.

Most of the trucks used by the company have a capacity of 10 tons and are of the 6-wheel type with 4 dual pneumatic-tired rear wheels. Some, however, are of the 4-wheel type with two single pneumatic-tired wheels which have been added. The trucks are used singly on small jobs or, where larger quantities of material are required, with trailers, which are pneumatic-tired and have capacities of 8 and 10 tons. The 8-ton trailers are of



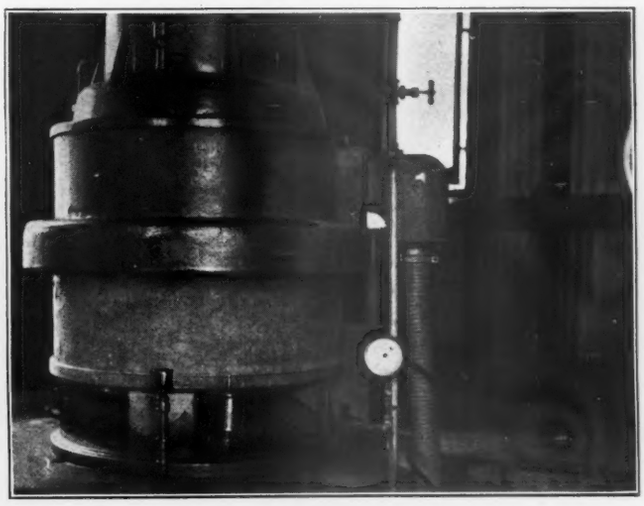
Two electric vibrating screens which do the fine sizing at the gravel end of the plant.

a new type and have detachable bodies. On arriving at a job the truck is detached from the trailer and dumped. The empty truck then returns and backs up to the trailer, shoving the trailer body on the truck body, where it is clamped in place. This body is then dumped and put back on the trailer. This operation is very simple and requires only a few minutes to perform. Batched and simple sizes of aggregates are delivered in the same trucks. Detachable batch gates are stored at the yards when not in use.

In March of this year the Consolidated company added ready-mix-concrete service to its other services already outlined. Los Angeles has been one of the last of the large centers of industry and population to get this service and officials of the company felt that its success in other places warranted its induction into their business. Previous to this time a similar service has been available to contractors and builders in Long Beach and La Manda Park, but neither of these companies came into Los Angeles.

The Consolidated company has 25 Jaeger mixer bodies that are used as mixers-in-transit. Two Rex mixer bodies have been added to the equipment but had not been delivered at the time of going to press although their arrival was expected shortly. The Rex machines are of 4-cu.yd. capacity each and are mounted on 6-wheel Pierce-Arrow trucks. The Jaegers are mounted as follows: Ten 4-cu.yd. units on 6-wheel Pierce-Arrow trucks; twelve 2-cu. yd. units on 4-wheel Fageol trucks fitted with dual tires in the rear; three 1½-cu.yd. units on 4-wheel Pierce-Arrow trucks fitted with dual tires in the rear.

These mixer trucks are loaded from central proportioning plants of which the company has four in the city of Los Angeles at its Alameda St., Slauson



One of the two deep-well pumps which supply the plant with water.

Av., Home Junction, and Sherman branches, and a fifth in the county.

This loading is done at the bunkers through batch hoppers equipped with scales. There are four of these, one for sand and three for three sizes of rock. The water is put in at the bunkers while

Weigh-batchers beneath the loading bins at the "Big T" plant.

the truck is loading sand and rock and while it is on the level and still. Immediately that the required number of gallons of water has been put in, the valve is shut. Water is loaded out of the regular tank that comes with the mixer and is all in by the time the rock and sand are in. The cement goes in last. Any flaky admixture to be added to the design is loaded when the cement is. The required number of sacks of cement goes up an elevator from the cement warehouse and down a chute into the

Some of the trucks lined up at the double scale-house at the Alameda yards.

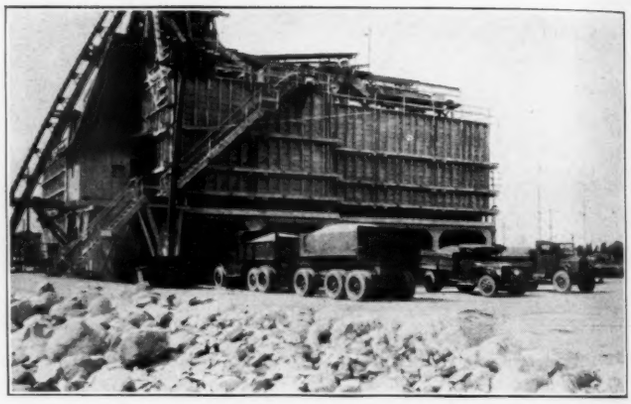
cement-loading cone. Other admixtures are loaded with the sand and rock.

Harry D. Jumper, civil engineer with the Consolidated company and in charge of the mixed-in-transit operations states that the company uses a 15-min. mixing time, as experimentation has shown that this is about right. On a long haul the driver does not start mixing until within 15 min. of the job.

Under Mr. Jumper's supervision all materials are tested in accordance with the standards set forth by the American Society of Testing Materials with the company's testing equipment. These tests include those for void contents, screen analysis, fineness modulus, moisture determination, and specific gravity. Unit weights per cubic foot are determined. Fuller's maximum-density curve is used as a basis for design.

Concrete strength tests are carried on. Standard cylinders of the different mixes used are made from samples taken from the mixer when delivery is being made. From these the company hopes to be able to show considerable increased strength over the same cement ratio formerly used in concrete.

The central distribution headquarters are located at the company's Alameda St. plant and the distribution and delivery to the job are handled by the transportation division of the company with the same distribution system employed for its other trucks. Mixer-trucks are dispatched from the Alameda proportioning plant by the division superintendent to the central loading plants nearest the construction work to be served. He dispatches the required number of trucks to the plant to deliver the batches at the times required.



Much small-quantity buying as well as big-job distribution goes on at the Home Junction plant.

As all the trucks park at Alameda at night and in order to eliminate their running around empty, on their first trip in the morning the trucks hauling ready-mixed concrete to a job near another distributing plant load at Alameda, so that none go out empty, but return to the bunker nearest the job for the second batch.

Walter Moore, Jr., general sales manager for the company, says that the big problem at present is to get the proper number of units to work economically. Not only is much manipulation necessary in the traffic department, so that trucks are not tied up or held idle, but the sales department has its problem of striking a balance between more jobs than can possibly be handled and idle trucks.

In the opinion of Mr. Moore the ready-mixed-concrete service is just another service. He says:

"Our company not only produces and distributes sand, crushed rock, and gravel, but it carries and distributes a full line of building materials, a department that has been added in the last two years. The ready-mixed-concrete service is just one more added service that we may properly serve the construction industry.

"In the promotion of this department, other than additional engineers and service men, we are using our regular sales force, which works in assigned territories and also on assignment of customers, under a controlled method of reports and follow-up systems to measure its efforts and success.

"To assist our sales force we are using direct-by-mail pamphlets and trade-journal advertising. The general newspaper advertising consists of feature write-ups on special jobs.

"We are relying a great deal on educational work for increasing the use of our new mixed-in-transit service, and we are giving salesmen technical instruction in the proportioning, mixing, and placing of concrete of various strengths; in the effect of water control; the proper slump of the mixture; and the advantages to be derived from the use of this service.

"Each salesman carries a leather folder with a complete set of pictures of the jobs actually serviced in his territory. It gives a local touch to his approach to the prospective customer and that is a help.

"Without bragging, I think we keep closer track of leads and sales than any concern in a similar business. We are handling the promotion of our ready-mixed service in the same manner. Leads are a matter of record, as is the follow-up. Our follow-up sales control is in charge of a division of the sales department that does nothing else. Considering the short time we have been developing this department we have gone forward.

"It is surprising how new services always 'pep' up the sales department. They act as added talking points which afford entrée to a customer, an opening to be followed up with the basic commodities of sand, rock, gravel and building materials."

The firm allows a 20-min. free standing or unloading time. Its demurrage after that is $4 an hr. for a 4-cu.yd. unit, $3 an hr. for a 2-cu.yd. unit, and $2.50 an hr. for a 1½-cu.yd. unit. This is stated in the first contracts, but is not being enforced at present as the company feels that the ready-mixed-concrete service is just as new to the contractor as it is to its men. To date it has poured everything from frame-dwelling foundations to Class A pavement. One Class A pavement job for the Board of Public Works of the City of Los Angeles was poured at the rate of 45-cu.yd. per hr. and was done with eight 4-cu.yd. mixer-trucks or their equivalent, a short haul of 4 blocks from the proportioning plant to the job making the speed asked for possible.

Truck-load of stone being sprayed with water before delivery.

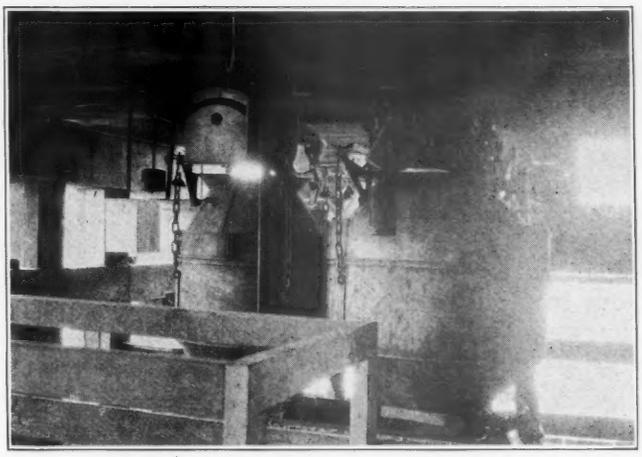
One of the best ways to promote business is through service given the customer, in the opinion of J. R. Allder, manager of the building-material department of the Consolidated company. He uses the very successful history of the company's mixed-mortar plant to illustrate his point.

The building-material department of which Mr. Allder is the head has completed two successful years. It carries lime, cement, plaster-lath and plaster, which are distributed from three points in Los Angeles. The mixed lime-mortar is mixed at one central plant and not in transit and is a continuation of the Atlas Mixed Mortar Co., established in 1908.

Direct contact is Consolidated's method of going after "first business" and the service rendered makes solicitation of additional business a simple matter, according to Mr. Allder. There are 15 salesmen out all the time. They follow permits, architects' leads, advance notice secured from architects, bidding on public jobs, and public letting.

The Merrill bunkers and office. These are typical of all the company's distributing plants.

That each of the various types of building material has its own peculiar advantages for various types of construction and that the merchant should recognize them, is the argument advanced by Mr. Allder. The company carries a full line of building material, and it depends on the type of job, says this building-material man, just what should be used. Most of the lines handled by this firm are made for the particular section in which they are



Two of the four batching hoppers for loading mixer trucks.

sold so that climatic considerations have no bearing upon the subject.

The mixed-mortar plant, which has been so very successful, is just a question of service, Mr. Allder says. The mortar is delivered on the job as used and according to a schedule given the company by the contractor.

"Roughly speaking," Mr. Allder says, "75 per cent. of our work over the territory has been mixed mortar. There are times when the percentage has climbed to 90. The profit depends upon the market. Sometimes it's good and sometimes it's terrible. The percentage of profit usually depends upon the cost of the ingredients at the time of taking a job.

"It is just another way of giving service and just another means of getting rid of materials. The builder can get his materials and we can do the work of getting rid of them as economically this way as any other.

"The cramped space on a city job and the city ordinance which requires lime to be slacked 5 days before being used give this method preference over that of mixing on the job, except in the event that a long haul makes the price too high. We age the lime at the plant. Where there are many craftsmen working, delivering lime and sand and stacking up 5 days in advance leaves no room for any one else. A 15-sq. ft. space and an outside drive are all we need.

"We take care of the territory within a radius of 15 to 18 mi. of our central-mixing plant but, where the haul goes above that and the builder can get local sand, it is cheaper for him to mix and we always advise it.

"Even in the event of a rush job at the oil fields mixed mortar has proved its advantages over mixing on the job in the case of the long haul.

"Our chief talking point is the service and the fact that the builder gets uniform material, as it is manufactured by experts in the business and these people are watching it all the time."

The main office of the Consolidated Rock Products Co. is at 656 South Los Angeles St., Los Angeles, Cal. The officers are: F. J. Twaits, president and general manager; Frank W. Clark, vice-president; Robert Mitchell, secretary; Carl H. Wittenberg, vice-president and treasurer; and L. L. Rogers, general production manager.

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## The Cement Industry in Columbia

Since its treaty with Peru, Colombia has had an area of 497,300 sq mi. The 1928 census showed a population of about 7,992,000, or approximately 16 per sq. mi. This is the only South American country which has ports on both oceans. The varying altitudes give the country all degrees of climate from tropical to frigid, and its mineral, agricultural and stock-raising possibilities are very large. Only about 10 per cent. of the population is in the large cities, of which Bogota on the temperate plateau is the most important. Incoming commerce is received on both Pacific and Caribbean coasts and has inland distribution from ports on both, or to farther districts through Medellin and Bogota. There is also a small section in northeast Colombia which draws its trade more easily from Maracaibo through Venezuelan territory.

Colombian consumption of domestic and foreign cement reached its peak in 1929, when the government and independent enterprises were undertaking extensive construction of public works and buildings. The serious economic depression has reduced consumption until now the demand is abnormally low.

*Domestic Cement Plants.*—Cia. de Cemento Samper has had a cement plant in operation in Bogota for many years, and during the peak consumption period Colombian interests promoted two new plants—Cia. de Cemento Diamante, whose plant began work in December, 1930, at Apulo, and a new plant for the Samper company at La Calera. Construction of the latter has been temporarily suspended on account of economic conditions. The Apulo plant, while operating, is not yet completely finished; it represents a heavy investment, and unless a decidedly favorable swing in business conditions takes place within a few years it may be difficult for the owners to operate at a profit. Its distance from Bogota would place it at a decided disadvantage in competition with the new plant, just outside that city. At present Diamante can compete with the Samper plant because the unit cost is much higher for the Bogota plant than for that at Apulo. Up to the present a substantial sum of money has been invested in the new Samper plant at La Calera; machinery was brought in when transportation and labor rates were at their highest levels, and work was stopped when the Samper corporation ran out of funds. It has been endeavoring to secure a loan of $500,000 to complete the mill.

*Manufacture by Foreign Interests.*—British and Belgian interests have considered the advisability of erecting a modern cement plant at Medellin, in the Dept. of Antioquia. To obtain the basic materials it would be necessary to construct an aërial cableway. American interests have made a survey of the actual and potential outlets for cement plants in the country, but it is understood that nothing definite will be done until the economic situation improves.

The accompanying table shows import statistics for the last four years available.

IMPORTS OF CEMENT INTO COLOMBIA (*bbl.*)

| Source | 1925 | 1926 | 1927 | 1928 |
|---|---|---|---|---|
| Germany | 39,804 | 35,567 | 160,929 | 79,251 |
| Netherland Indies | 1,111 | 106 | 524 | 582 |
| Belgium | 18,032 | 14,798 | 67,032 | 104,660 |
| Canada | ..... | 23,654 | ..... | 11,453 |
| Denmark | 73,747 | 143,376 | 110,948 | 345,356 |
| Ecuador | 20 | 114 | ..... | 208 |
| United States | 87,890 | 64,661 | 73,209 | 84,580 |
| France | 241 | 402 | 535 | 4,177 |
| Great Britain | 5,017 | 3,976 | 1,207 | 1,892 |
| Netherlands | 19,794 | 50,970 | 116,935 | 21,053 |
| Panama | 34 | 32 | 1,798 | 1,205 |
| Sweden | 3,541 | 17,476 | 48,357 | 18,554 |
| Venezuela | 1,109 | 2,422 | 3,386 | 5,777 |
| Norway | 2,167 | ..... | 2,118 | 104,736 |
| Other countries | 8 | 259 | 144 | 3,554 |
| Total | 252,515 | 357,823 | 587,122 | 787,038 |

The Inland Lime & Stone Co. quarry at Manistique just as the blast was fired.

By A. J. CAYIA
*General Superintendent, Inland Lime & Stone Co.*

# Huge Blast at Inland Quarry Dislodges 1,250,000 Tons of Material

## 220 Tons of Explosives, 38 Miles of Fuse Used; Shock Recorded at Washington, D. C.

WHAT is reported by explosives engineers to be the largest commercial blast on record in the United States was fired March 16 at the limestone quarry of the Inland Lime & Stone Co., a subsidiary of the Inland Steel Co., about 22 mi. east of Manistique, Mich.

The blast resulted in the successful breaking of approximately a year's supply of limestone [1] and proved the engineer's estimates on the economy and effectiveness of a large shot over an extended area.

A total of 440,966 lb. of explosives was fired. The successful firing of a large shot at this quarry last year, when more than 313,000 lb. of explosives was used, focused the attention of the quarry management on the effectiveness of large blasts. Under this system, the drilling can be done during the winter, utilizing the summer operating organization. This allows practically year-around employment for the large majority of our employees, whereas normally they would be employed only during the season of navigation.

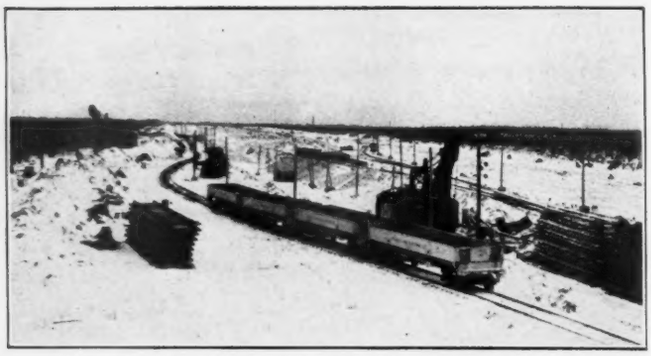
The area drilled covered a space 4,400 ft. long and 200 ft. wide. Over 4,000 6-in. holes were drilled by 9 blast-hole drills over a period of 3½ mo. The total footage of this was over 125,000. The large number of holes was made necessary by the fact that three track benches were included in this area and closer spacing and greater overdepth drilling was required to obtain proper fragmentation.

A survey by explosives engineers of the Hercules Powder Co. determined the quantity of explosive needed for each hole and a general plan for the blast was formulated in conjunction with the quarry management. An accurate record of the fragmentation obtained in specific areas by the 1931 blast was the basis for determining the loading factor, the selection of the type and strength of explosive, also the location and amount of deck loads.

The dynamite used in the blast consisted of 216,916 lb. of Hercules Gelamite A in 5x16 cartridges, and 224,050 lb. of Hercules 40-per cent. extra L F gelatin, in 5x16 cartridges. Gelamite is a new type explosive economically doing the work of gelatin in certain types of blasting. In this instance all the holes were at least partly filled with water and, although some of the powder was in the holes for 8 days, the surface conditions following the blast seemed to indicate complete and successful detonation.

Due to the shot being loaded in winter weather and the difficulty experienced with sand stemming last year, it was decided to use minus —½-in. crushed limestone. More than 40 car-loads of this

[1] The best estimates place the amount of rock dislodged at 1,250,000 tons.—Ed.



General view of the blast area before the shot was fired.

material was required and the ease of handling and its free-running quality considerably reduced the time required to stem the holes, and more than justified its choice.

Distribution of explosives over the area began Sunday, March 6; the actual loading started Tuesday morning, March 8. The bench holes were loaded first, and by Thursday night 1,300 holes had been loaded and 112,000 lb. of dynamite had been placed in the ground, complete with stemming. By Saturday night, March 12, 2,700 holes had been completed with a total of 275,000 lb. of powder in the ground. On Tuesday, March 15, at noon, the complete blast, or 4,031 holes, had been loaded and stemmed.

Distributing stemming by truck on the quarry ledge.

Tuesday afternoon was devoted to cleaning the area of empty boxes and stripping the Cordeau at each hole, making ready for connecting the next day. The Cordeau hook-up was started at 7:30 on Wednesday morning and 44 workmen completely hooked up the blast in 4½ hr., including the first inspection. The second and final inspection was made between the hours of 1 and 2 and the blast was fired at 4:02 p.m. (eastern standard time).

The loading operation was thoroughly organized to the end that the charges should be accurately placed as to quantity and at the proper depth. Previous to starting the loading, all the holes were sounded and, from tables previously prepared, the charge for each hole was determined according to depth and spacing. This charge, in terms of the number of sticks of each kind of dynamite, was written on a linen tag and placed at the hole. The depth of the hole was also marked on the tag, as was also an identifying letter corresponding to the nine arbitrary sections into which the quarry had been divided. When the loading of a hole was completed, this tag was turned in to the office. Its letter identified the section and was used daily to keep an account of the progress of the loading and also to check the total dynamite loaded in a section against the theoretical loading computed.

After the sounding of the holes was completed the dynamite was distributed to each hole in the quantities called for on its tag. Stemming was also distributed over the area in sufficient quantities to insure its being completed immediately after the charge was loaded.

The men engaged in the preparation and loading were given a printed card containing general and specific rules for safety in this work. Also detail instructions for the placing of the powder and Cordeau. A facsimile of the card is reproduced herewith. On the reverse side "Safety First" was printed in large red type.

When all preliminaries were completed several loading crews were started. Their routine was: First, to sound the hole to be loaded and if the depth did not coincide with the depth of the tag, to mark the hole, report it to the foreman, and move to the next one. If the depth checked, the Cordeau was laced through the first stick and lowered into the hole. The wooden tamping pole was then inserted to determine if the first stick had reached the bottom.

Explosives ready for loading.

If it had not, the foreman was called and took the necessary approved methods to get it to the proper depth before any more dynamite was added. After the first stick was properly placed the remainder of the dynamite was dropped a stick at a time and rammed home with the wooden pole, and held in place until the charge had been stemmed with approximately 3 ft. of fine-rock stemming to prevent the charge from being displaced by water pressure or any other cause. The loading crew then proceeded to the next hole. A stemming crew followed closely and completed the stemming.

Any holes not of the proper depth were reëntered by a drill kept on the blast area for that purpose, and cleaned out. A special crew of loaders then loaded these odd holes.

The Cordeau used in each hole and in connecting all holes required 143,563 ft. of double-countered

and 55,710 ft. of plain, a total of 199,372 ft., or about 38 mi.

The shot was worthy of comment from a safety standpoint because of the fact that there was not a single lost-time accident among the 70-odd employees of the Inland Lime & Stone Co. and the several Hercules explosives engineers during the unloading of the powder, its distribution, and the loading of the holes. This perfect safety record was particularly commendable by reason of the fact that the worst weather of any time in the winter, in the shape of high winds and biting cold, was experienced during the 9 days in which the shot was being loaded and connected. Among all the employees assisting in the loading, there was no report of a powder headache.

Because of the size of the blast, it incurred wide popular interest and representatives of three newsreel companies were at the quarry securing talking pictures. The U. S. Bureau of Mines was represented by J. R. Thornen, and the U. S. Coast and Geodetic Survey by Lieut. E. J. Browne. While the shock from the explosion was scarcely noticeable at any distance immediately removed from the quarry, earth tremors naturally occurred, and these could be picked up by geophysical apparatus. In order to aid seismological stations in measuring the vibrations through the underground structure, the exact time of the explosion was noted, using time signals by radio from Washington. Seismographic records of the earth tremors were obtained at Buffalo, N. Y., Madison, Wis., East Lansing, Mich., and at Georgetown University, Washington, D. C.

Close view of the bank after the blast, showing fragmentation.

According to Lieut. Browne, the switch operating the electrical detonating apparatus closed, by Arlington time signal, at 4:02 p. m. (eastern standard time). The actual detonation occurred 0.977 sec. later. The resulting tremor was recorded at Georgetown University, Washington, about 691 mi. away, at 4:07:03; at Canisius College, Buffalo, 441 mi. distant, at 4:03:26; at the University of Wisconsin, Madison, about 263 mi. away, at 4:03:02; and at Michigan State College, East Lansing, 246 mi. away, at 4:02:59.6 (first shocks).

The blast area during loading of the holes.

Various officials of the Inland Lime & Stone Co. and its parent company, the Inland Steel Co. of Chicago, witnessed the blast. W. J. Keese and C. D. Peacock were Hercules explosives engineers on the job, and the author had charge of the operations.

"After a study of the records of the Oppau explosion, as well as several other earthquakes which were recorded on seismographs less than 800 km. distant, Dr. Harold Jeffreys of Cambridge identified six sets of waves, three compressional, and three distortional, which traveled each with its own constant velocity," says Rev. J. S. O'Conor, S.J., director of the Seismological Observatory of Georgetown University, Washington, in discussing the Manistique blast.

"His interpretation of these phases may be found in his book *The Earth*, 2d ed., MacMillan, p. 95 *et seq.* Briefly we may say that he proposed three surface layers: (1) the granitic, about 10 to 15

Loading and stemming crews at work.

**INLAND LIME AND STONE COMPANY**

**PORT INLAND, MICHIGAN**

You are being employed on work which is safe if you follow instructions—but dangerous to yourself and others if you disobey orders

**THE FOLLOWING RULES MUST BE STRICTLY ENFORCED. ANY INFRACTIONS WILL BE PUNISHED BY INSTANT DISMISSAL!**

1. Smoking or striking of matches are strictly prohibited within the blast area, or where explosives are stored or unloaded.
2. Use no metallic tools of any kind in opening powder boxes. Wooden mallets will be furnished. Do not use any tools in any phase of the work, except those furnished you by your foreman.
3. In stemming holes, care must be exercised to prevent shovels, pails, or any metallic tools from striking against casing protruding from hole.
4. Never start to load a hole unless it has a stake marked with the proper loading
5. Never charge the second stick unless sounding shows the first stick reached bottom
6. See that the Cordeau is kept near center of the hole and does not touch casing
7. Never make a sharp kink in Cordeau.
8. Never leave hole after loading without placing at least 4 feet of stemming on top of charge.
9. Pile all empty powder boxes and covers so they cannot be walked on or fallen over
10. Return hand tools when finished.

The success of this shot depends in a large measure on the speed and accuracy of loading, so observe all instructions faithfully and inform your foreman promptly if you discover any infractions, for your own safety. Do not talk about the shot away from the job or invite your friends out, as every one will be excluded, from the time loading starts.

NOTE:—Read the above carefully, carry this card with you, and observe it faithfully that no accidents will happen and that the BLAST may be 100% perfect.

**Reproduction of card issued to men who were employed in making the blast.**

km. thick; (2) an intermediate, basaltic layer, probably 20 to 25 km. thick; and (3) an ultra-basic rock, probably dunite. A disturbance (explosion or earthquake) would then be propagated outward in such a way that one compressional wave would have its path entirely in the upper granitic layer. This he called Pg. A second compressional wave would travel down till, striking the basalt, it would be propagated along the upper boundary of this intermediate layer. This is to be known as P*. A third compressional wave would pass below both upper layers and be propagated along the upper boundary of the ultra-basic rock. This is the normal P or Pn. Similar paths with analogous notation were determined for the S or distortional waves, as may be seen from the accompanying diagram.

"The fact that both the exact time of origin and the location are known in the case of the Manistique explosion gives special value to the records from this blast in seeking confirmation for Dr. Jeffreys' interpretation of the crustal layers from seismological data. The exact coördinates of the blast site are not yet known, although the U. S. Coast and Geodetic Survey is taking steps to determine them. However, a preliminary computation of the wave velocities seems to be in accord with the values obtained by Dr. Jeffreys in continental Europe, at least as far as S* is concerned. At Georgetown University this phase, S*, was the only one registered. Taking the measured distance as 10 deg. (1,111 km.), the travel time of this wave was 5 min. 2 sec., giving a calculated velocity of 3.7 km. per sec., allowance being made, of course, for travel times in the passage up and down through the upper layer."

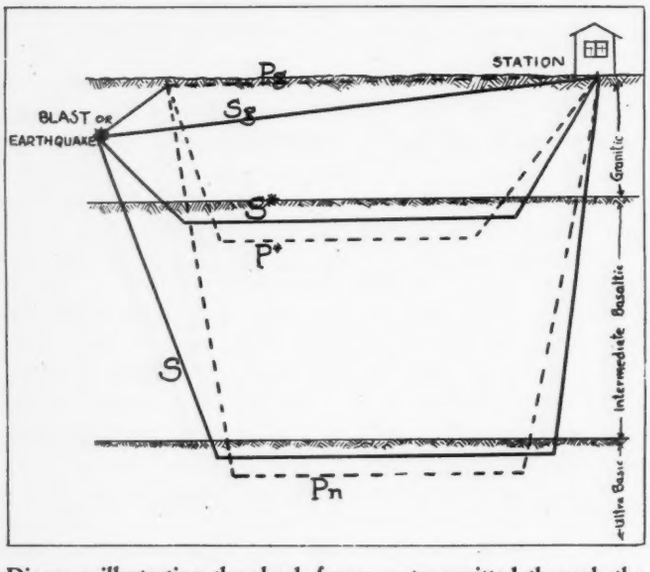



**Diagram illustrating the shock forces as transmitted through the layers of the earth.**

"A clear record of waves of small amplitude, lasting about 40 sec., was obtained on our Wood-Anderson torsion pendulum seismographs," says Prof. I. A. Sharpe of the Dept. of Geology of the University of Wisconsin at Madison. "Transverse waves which had traveled by three different paths through the crust of the earth were identified on our record: Sg, which were the slowest and had been propagated through the upper (granitic) layer of the crust; S*, which had traveled through an intermediate (basaltic) layer; and S, the fastest, which had traveled below the basaltic layer.

"Records of the S* phase were also obtained by the seismographs of Canisius College, Buffalo, and Georgetown University, Washington. Some calculations were made here, based on our records and those of the Buffalo and Georgetown stations with the following results: The velocities of the Sg, S*, and S waves were found to be 3.27 km. per sec. (2.04 mi. per sec.), 3.66 km. per sec. (2.28 mi. per sec.), and 4.3 km. per sec. (2.68 mi. per sec.), respectively. The thickness of the granitic layer was calculated to be 13.6 km. (8.5 mi.), and that of the basaltic layer 22 km. (13.8 mi.). These results are in essential agreement with results obtained in Europe by Dr. Harold Jeffreys and in California by Wood and Richter."

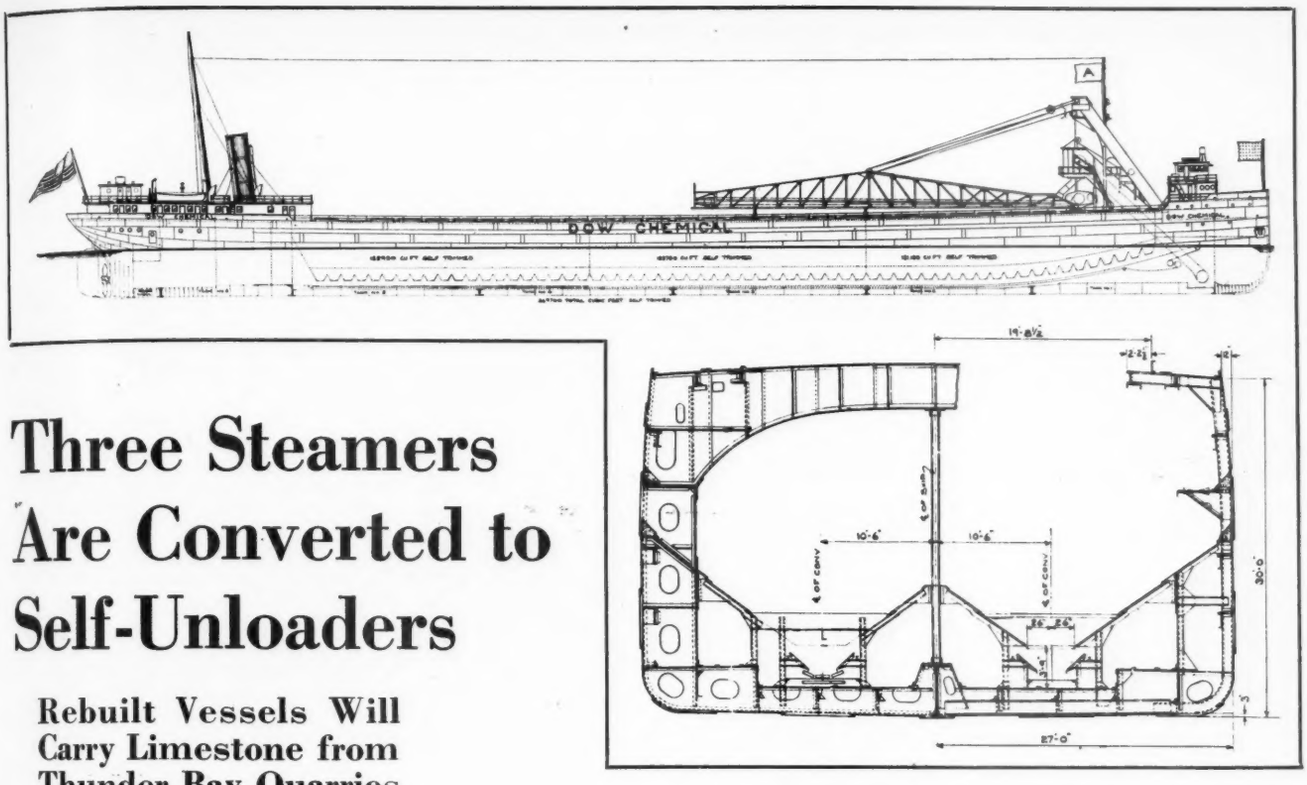
"At East Lansing, Mich., two very distinct series of waves were recorded, as well as another wave which we have interpreted as being the Rayleigh transverse surface wave," says Charles W. Chapman, professor of Physics at Michigan State College there.

"The first series arrived 59.6 sec. after 4:02, and consisted of five separate shocks spread over a period of a few seconds. The second series arrived 101.8 sec. after 4:02, and consisted of seven shocks. The Rayleigh wave arrived 151 sec. after 4:02, and consisted of only one tremor.

The apparatus used for detecting these seismic waves was constructed as follows:

"A very strong magnetic field, patterned in construction after the field used in a Magnavox speaker, was suspended by coiled springs from a tripod. Due to the large inertia of this element, it could not follow vibrations of high frequency. In this field and rigidly mounted on a light cedar post, set 4 ft. in the earth, was a very small coil of a large number of turns of fine wire. Since this coil was mounted on the earth's surface, it followed any vibration being transmitted by it. Due to its motion, in a vertical direction, in a magnetic field, an electro-motive force was induced in this coil.

*(Continued on page 38)*




# Three Steamers Are Converted to Self-Unloaders

## Rebuilt Vessels Will Carry Limestone from Thunder Bay Quarries Co. Plant near Alpena

Longitudinal and amidship sections of the "Dow Chemical" showing method of hoppering the hold.

THREE self-unloading vessels recently thundered down the ways at the yards of the American Ship Building Co., at Lorain, O., to begin service in transporting limestone from the new plant of the Thunder Bay Quarries Co., at Alpena, Mich., to Fairport, O. The ships were the *Diamond Alkali*, the *Thunder Bay Quarries*, and the *Dow Chemical*. Each vessel was formerly a steamship and was converted into a modern, self-unloader during the winter season.

The boats are all 504 ft. in length, the *Diamond Alkali* and the *Thunder Bay Quarries* being sister vessels, having the same dimensions—504 ft. by 56 ft. by 30 ft. The *Dow Chemical's* measurements are 504 ft. by 54 ft. by 30 ft. The conversion in each instance consisted, in general, of hoppering the holds to serve two belt conveyors running parallel along each side of the center line of the ship. These conveyors deliver to cross conveyors at the fore end, the cross-conveyors feeding to an inclined pan-conveyor which takes the cargo to the deck to be discharged by a boom-conveyor. The boom-conveyor is extremely flexible, being able to swing through a total arc of 226 deg.

Hatches over the hoppers are spaced on 12 ft. centers, while the throat openings of the hoppers are 4 ft. 4 in. by 3 ft. The hatches are spaced at 12 ft. center to center, while the hopper-discharge openings are 6 ft. apart. Hand-operated gates of an advanced design are used to regulate the flow of material to the belts. A sliding gate closes about two-thirds of the discharge, while a hinged plate closes the remaining portion, the hinged section serving as an apron when the gate is open. This method of controlling the discharge of material allowed the hoppers to be spaced more closely than usual in this type of vessel and increased the carrying capacity considerably. In addition, the hinged aprons prevent breakage of the material and surges on the conveyor belting by "laying" the cargo on the belts.

The two belt conveyors in the hold are 42 in. wide and are carried on 4-in. troughing rolls, spaced 2 ft. apart. The return idlers are spaced on 9 ft. centers. Reaching the forward end of the ship, the conveyors rise on a radius of about 300 ft. to a point about 15 ft. higher than the level sections. Here 42-in. cross-conveyors transfer the cargo to the pan-conveyor. Both the hold- and cross-conveyors are of similar design and travel at a belt speed of 350 ft. per min. Each belt in the hold is driven by a 75-hp., 440-v., 60-cycle squirrel-cage motor. The cross-conveyors obtain their power from these same motors by means of gear take-off built in at the head pulleys.

The pan-conveyor, which elevates the cargo to the deck for discharge by the boom-conveyor, is 96 ft. wide. It has a capacity of 2,000 tons of stone per hr. and is inclined at a 42-deg. angle, the total lift being 48 ft. A 200-hp. motor, similar to those which drive the conveyors in the hold, operates the pan-conveyor through a Robins-Falk herringbone-gear speed reducer. The discharge from the pan conveyor is to a cast-steel chute which deposits the material on the belt of the boom conveyor for discharge to port.

As stated, the boom-conveyor may be swung through an arc of 226 deg. to unload at either side

On deck aboard the "Dow Chemical." Note the hatch covers and boom conveyor swung out in unloading position.

of the ship. It has a maximum lift of about 55 ft. at the discharge point. The belt speed is 460 ft. per min., driven by a 200-hp. motor with a solenoid-operated brake.

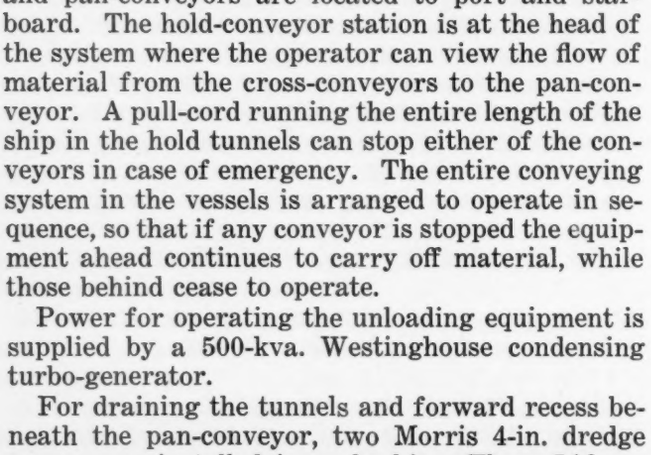
Motive power for the vessels is supplied by 3-cyl., triple-expansion engines with Scotch boilers.

On the starboard side of the main deck forward is located the main control panel for the conveying machinery, while control stations for the boom- and pan-conveyors are located to port and starboard. The hold-conveyor station is at the head of the system where the operator can view the flow of material from the cross-conveyors to the pan-conveyor. A pull-cord running the entire length of the ship in the hold tunnels can stop either of the conveyors in case of emergency. The entire conveying system in the vessels is arranged to operate in sequence, so that if any conveyor is stopped the equipment ahead continues to carry off material, while those behind cease to operate.

Power for operating the unloading equipment is supplied by a 500-kva. Westinghouse condensing turbo-generator.

For draining the tunnels and forward recess beneath the pan-conveyor, two Morris 4-in. dredge pumps are installed in each ship. Three Lidgerwood reverse-valve steam winches are used to swing the boom, two operating on the swing while the third handles the tag line. A Clyde two-drum hoist serves to elevate the boom.

The Robins Conveying Belt Co., which has had considerable experience in outfitting self-unloading vessels on the Great Lakes, supplied all the conveying equipment, including the belts and drives.



View of the cargo hold during construction showing design of the hoppers.

Starboard tunnel on the "Thunder Bay Quarries" showing operating mechanism of the hopper gate.

Motors and solenoid brakes were designed and furnished by the General Electric Co.

Each of the vessels has a rated unloading capacity of 2,000 tons of stone per hr. or 1,120 tons of coal, it being planned to transport coal cargoes at times. The equipment is capable of a 20-per cent. overload.

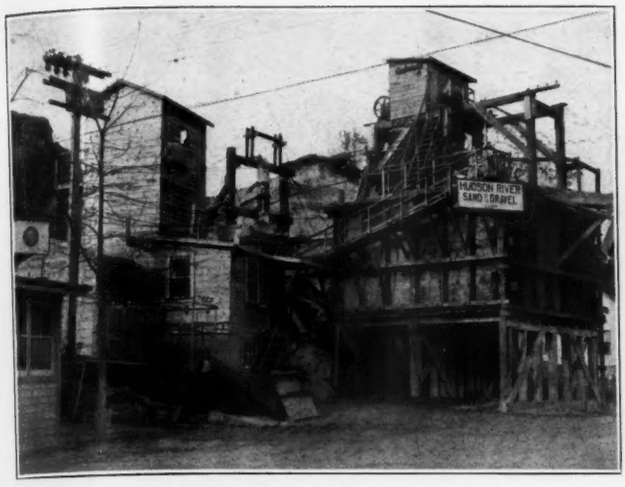
## Blast at Inland Quarry Dislodges 1,250,900 Tons of Stone

(*Continued from page 36*)

This electro-motive force was greatly amplified by means of a 3-stage resistance coupled amplifier. The output of this amplifier was sent through a Dudell type oscillograph element. In this manner a photographic record was obtained, both of the actual disturbance and of time signals spaced at intervals of 10 sec."

The arrival times of various wave trains from the Manistique blast were read from the seismograms of the Seismological Observatory, Canisius College, Buffalo, as follows: 4:03:26, 4:04:40, 4:05:06, and 4:05:54, all eastern standard time.

"Closer study of the grams very probably will reveal further data, and possibly will require slight revision of these readings," says Rev. John P. Delaney, S. J., director of the observatory. "At any rate the blast has afforded very valuable working material. In the light of Jeffreys' travel time tables it would seem that the first and third of the above readings are to be identified as the primary ultra-basic and secondary basaltic phases, respectively. Certainly they conform well with the tables. The other two readings, the second and fourth, remain unidentified to date, but our work with them has hardly begun."




The plant, with office and hoist-house at left.

Scraper discharging to grizzly over plant hopper.

# Operator Stationed in Tower Controls Excavating at Gravel Plant

ONE of the many small sand-and-gravel plants built in 1931 to meet local demands for aggregates was that of the Hudson River Sand & Gravel Corp., at Annsville, N. Y. This plant is of timber construction throughout. It is located on New York State Highway No. 9 and on the north side of Annsville River. Annsville is located on the west bank of Hudson River, 2 mi. north of Peekskill. The plant went into operation in the spring of 1931.

The deposit is similar to others in this vicinity and consists of a hill of gravel with a high sand content. Only a small percentage of the gravel is large enough to require crushing. There is enough gravel in this deposit to last 10 yr. or more.

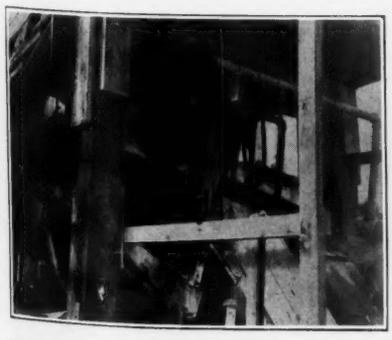
In the pit a Bucyrus 31-B steam shovel feeds the gravel to the path of a Beaumont 1½-cu.yd. LeClair power-scraper. This discharges through a 10-in. rail-grizzly to a wooden hopper. A lever-controlled sliding gate feeds from the hopper to a single-deck Niagara vibrating scalping screen. Oversize material is chuted to a 36-in. by 10-in. Farrel-Bacon jaw crusher; both the "throughs" from the screen and the product of the crusher are discharged to a chain-bucket elevator.

The elevator discharges at the top of the plant to a triple-deck Niagara vibrating screen, which produces three sizes of gravel and sand. The 1½-in. and ¾-in. gravel and the pea gravel are chuted directly to storage-bins. Sand passing through the bottom deck goes to a Sprout-Waldron twin-screw washer, the product of which also goes to storage while the overflow is flumed to the near river. Any excess of sand is loaded in trucks and stock-piled near the plant. Excess pea gravel can be chuted to stock-piles or can be added to the 1½-in. gravel when special mixes are desired. A Nelson gasoline stock-pile loader reclaims from the stock-piles into trucks.

The timber bin has a capacity of 800 cu.yd. and is divided into four compartments. Trucks are backed under the bins and loaded through Sprout-Waldron clam-shell gates. All shipments are made by truck.

Water for washing the sand and gravel over the secondary screen and in the screw-washer is supplied by a small American Well Works centrifugal pump in a small wooden building near the river. The 2-drum Beaumont hoist operating the scraper

(*Continued on page 44*)



Triple-deck sizing screen with spray jets overhead.

Vibrating scalping screen, jaw crusher and elevator to screening building.

The twin-screw sand-washer located in the screening building.

By E. P. ROTHROCK
State Geologist

# Nonmetallic Minerals of South Dakota

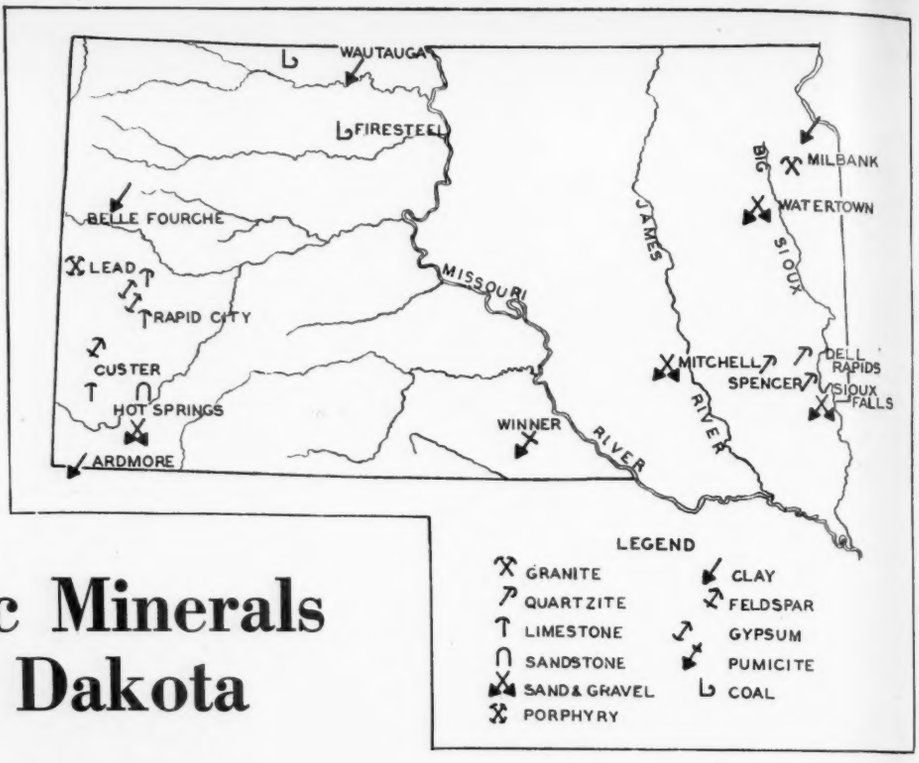



Fig. 1. Map of South Dakota showing locations of some of the more important operations.

SOUTH DAKOTA is a young state. Less than a generation ago the Wild Bills and Deadwood Dicks were making its opening history. In fact its history is so recent that most of our eastern neighbors still look for the big herds of buffalo and the bands of bloodthirsty Sioux as they venture within the boundaries of our state.

The buffalo have gone long since, and the Sioux are a pleasant and neighborly people, living, for the most part, on the government reservations. The romance of the plains has given way to the unromantic job of acquiring a place in which to live and three more or less square meals per day.

But civilization means building and building demands building material. Hence the quarries of the state were started and still exist largely to meet the demand for building materials. The first materials naturally were adobe and sod, which were used in the construction of most of the early houses of the plains. These materials, however, did not lend themselves to exploitation on a large scale. No imposing quarries or great plants are required to supply a population with adobe. The adobe quarries, therefore, consisted largely of little holes in backyards, or what might correspond to backyards in a land where the backyard was likely to end somewhere near the horizon. The quarry was abandoned as soon as the house was done, and a new one opened on each new location.

The sod industry went on much the same basis. A good patch of buffalo grass, a sharp spade and a strong back were the only requisites for exploiting this material, and in most cases the future owner of the building was president, vice-president, foreman, time-keeper, and quarryman in the sod quarry. When the house was done his sod quarry was promptly abandoned. The president, vice-president, foreman, time-keeper and quarryman was fired and promptly forgot all about his trade in his bitter pioneer struggle to gain a foothold in the new land of promise.

It was not long, however, until the demand for better materials opened quarries which were to be the forerunner of a more permanent quarrying industry. Brick plants sprang up all along Missouri Valley. The black gumbo shales which line the valley could be burned with considerable success, and many of the glacial clays made bricks which were usable at the time but were so soft that they did not stand the tests of long exposure. The chalk rock, which lines lower Missouri Valley and underlies most of James Valley, also proved to be an easily obtainable building stone, and a score or more of buildings still stand in the towns of southeastern South Dakota as monuments to the quarrying of this material. It proved to be too much of a temptation to the small boy who will cut his initials in anything soft enough to be carved, and, with the coming of an era of lowered freight rates on lumber, chalk rock and brick passed out of existence as building materials.

In spite of the failure of these early attempts to start large quarrying industries in the state, the demand for material continued and new products were exploited, which better filled the changing needs. Though other materials which find a market in industries outside the state are now quarried, the structural materials still make the backbone of the state's production. The annual value of stone, and sand and gravel excavated exceeds the value of all other mineral products of the state excepting gold. Fig. 1 shows the general distribution of nonmetallic minerals in the state.

*Stone.*—South Dakota contains a great variety of stone which can be used in construction. It included many kinds, ranging from the soft chalk, through the sandstones, to granites and other igneous rocks. The present production, however, is confined chiefly to granite, quartzite, limestone, and sandstone.

*Granite.*—Granite quarrying and polishing is confined to the northeastern corner of the state, the center of the industry being the city of Milbank in Grant County. The quarries lie 4 mi. east of the city near the main line of the C. M. St. P.& P. Railroad.

The stone is a dark reddish-gray granite which goes by the trade name of "mahogany granite," (Fig. 2), because of its resemblance to the color of that wood. Color variations occur, however, in different quarries, usually in the amount of reddish tint. The deepest reds are sold under the name of "royal mahogany." The stone takes a beautiful polish and is sold almost exclusively for ornamental purposes. Part is sold locally, but most of the product is shipped to markets east of Mississippi River.

Four companies are engaged in quarrying this granite. Three of them have headquarters in Milbank, where two large grinding and polishing plants, having a capacity of about 4,000 tons, prepare the stone for market. A fourth company is located at Ortonville, Minn. Production of this stone has been steadily increasing in value since 1920. In the ten years previous to 1930 the value of the stone produced has quadrupled itself.

*Quartzite.*—Probably the earliest stone quarried in South Dakota was the pink quartzite, which underlies a large area in the southeastern part of the state. It was one of the first materials used in the construction of buildings at Sioux Falls, and has been sold under the trade name of "pink granite" ever since. Its durability, uniform color, and lack of discoloration on weathering made it a great favorite for public buildings, paving, and other structures. It takes a high polish, and has been used rather extensively as an ornamental stone.

Its jointing is decidedly in its favor, as it can be quarried in blocks of convenient size. Trimming and dressing a rock as hard as this quartzite, however, were rather expensive and the competition

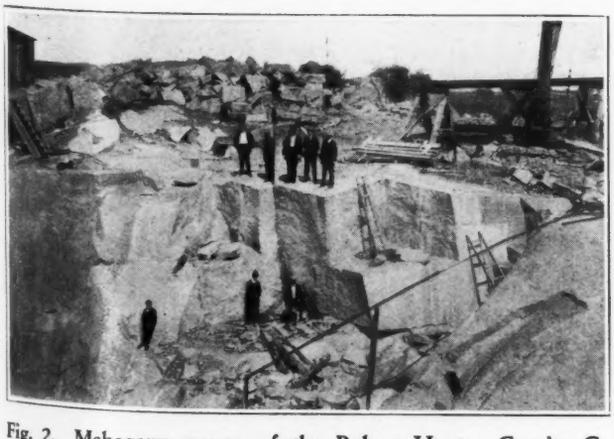


Fig. 2. Mahogany quarry of the Robert Hunter Granite Co. at Milbank.

of concrete and more easily dressed rock has caused its use as a building stone to be largely abandoned. The rock is still the most important structural stone in the state, however, for it is an excellent aggregate for concrete and other purposes where crushed rock is necessary.

The stone was first excavated in the vicinity of Sioux Falls, East Sioux Falls, and Rowena, and a number of abandoned quarries testify to the business that once flourished at these points. The present business, however, has moved westward, and now centers about Sioux Falls (Figs. 3 and 4), Dell Rapids, 20 mi. to the north, and Spencer (Fig. 5), 50 mi. to the west. Crushing and screen plants are in operation at these points, two at Sioux Falls, two at Dell Rapids and one at Spencer.

*Limestone.*—As a building stone South Dakota limestone has never held the favor that has been enjoyed by quartzite and sandstone. This may be

Fig. 3. Quartzite quarry of the Wisconsin Granite Co., Sioux Falls.

due in part to the lack of good limestone for this purpose, in places easily accessible to the more densely populated portions of the state, and in part to the fact that where it is available it must compete with sandstone which is much more easily dressed. The limestone quarries now in operation are located in the outer part of the Black Hills. Their product is sold as rip-rap, crushed rock, or lime, the latter being used locally, in construction, in metallurgical processes carried on at Black Hills refining plants, and in beet-sugar refining at Belle Fourche, and the Colorado refineries.

Twenty-four quarries are equipped to produce stone and six have kilns for burning lime. The individual capacity of the crushing plants varies from 200 tons to 4 or 5 car-loads per day, depending upon the sort of stone needed, and the capacity of the plants for burning lime averages about 2,500 tons per year. Quarries equipped with crushers are to be found at Spearfish, Rapid City, and Hot Springs, and lime kilns are located near Spearfish, Calcite, Rapid City, and Pringle.

The annual limestone production has varied in value between $30,000 and $100,000, the average being between $65,000 and $75,000. On the whole, there has been a slight increase in production during the latter half of the 1920-1930 decade, probably

Fig. 4. Quartzite crushing plant and quarry of the Dakota Granite Co., Sioux Falls.

due to increased activities in the industries using lime and limestone in the vicinity.

*Porphyry.*—Besides the major stones mentioned above, quarries have been opened on rock peculiar to certain localities. Near the city of Lead a light-colored volcanic rock, known as "porphyry," is crushed. It is an extremely tough rock, and is used largely in hard-surfacing roads. The quarry is run by the city of Lead to supply materials for use by the city and for the accommodation of its citizens.

*Rock Gypsum.*—Plaster plants are in operation in the Black Hills, a short distance northwest of Rapid City. One is located at Black Hawk and one at Piedmont. Fifteen-ft. to 20-ft. seams of gypsum are found outcropping among the red beds which encircle the Black Hills and furnish the raw material for this industry. The rock is mined rather than quarried, because the seams dip sharply to the east, and are soon covered beneath other sediments. The room-and-pillar method, commonly used in eastern coal fields, is employed in the excavation. Plants of 200-ton and more daily capacity are located at each of the places mentioned. The entire production of these two plants is calcined, but a fireplace at the State Park Game Lodge, made of polished blocks of this rock, suggest a possible use as an ornamental stone.

*Sand and Gravel.*—Sand and gravel are the most valuable structural materials in South Dakota. Although considerable amounts had been produced for various other uses for some years, their widespread use came with the expansion of the road program of the state. So rapid was this highway expansion that there was an enormous increase in the business of the pits already opened and a feverish search for new supplies. A network of 4,500 mi. of gravel roads was spread over the state in less than 10 yr. Within five years, 1922-27, the number of passenger buses leaving Sioux Falls increased from 2 to 40 a day.

The enormous demand for gravel for surfacing these highways was augmented by the increased use of gravel and sand as concrete aggregate. Most of the gravels of the state are of glacial origin and not sufficiently clean or properly sized for concrete. For this reason washing and screening plants have thrived and will continue to be a necessity as concrete construction continues.

Fig. 5. Consolidated Stone Co. quarry in quartzite, Spencer.

Road-surfacing material comes largely from roadside pits, where it is either used as pit run or graded in portable crushers and screens. These pits therefore, are either temporary or sporadically operated. The permanent gravel industry is largely located in the valley of Big Sioux River in the extreme eastern part of the state (Fig. 6). Early demand located washing and screen plants on large gravel deposits in this valley and, because they had excellent railroad facilities, they have held the

trade. Two large washing and screening plants are in operation north of Sioux Falls and three in the vicinity of Watertown. Gravel production was valued at more than $1,000,000. Large amounts of material are shipped as pit-run from the Big Sioux Valley pits just mentioned and from others which operate no screening plants. Two smaller screening and washing plants are in operation, one at Mitchell in James River Valley, and one in the western part of the state, at Oral in Cheyenne Valley. These plants do a thriving local business.

*Brick Clay.*—At present the state produces brick and tile clays and a freak clay known as Ardmorite, which is used in water softeners. Little trace remains of the small brick plants which once dotted the eastern part of South Dakota, but three modern plants have taken their place, one at either end, and one in the north-central part of the state.

The eastern plant is located at Milbank in the extreme northeastern corner of South Dakota, and produces a yellow brick of very good quality, which

Fig. 6. Drag-scraper in gravel pit of Consolidated Stone Co., near Sioux Falls.

is made from a deposit of glacial clays. The plant consists of five coal-burning kilns, which have an annual capacity of about 5,000,000 bricks.

The western plant is located at Belle Fourche. A red brick and tile is produced by burning a clayey shale which outcrops near the plant. This modern plant is well equipped for making common and face brick, and tile. It is a four-kiln plant, fired with both coal and gas.

The third plant is located at Wautauga in Corson County, near the northern boundary of the state. It uses Tertiary clays as raw material, and has a capacity of from 100,000 to 150,000 bricks a year. This plant is equipped to manufacture face or common brick, building blocks and tile.

*Ardmorite.*—Ardmorite is a white colloidal clay, very uniformly fine-grained and smooth when wet. It occurs in some of the shale formations in the western part of South Dakota, and is related to the clay called bentonite, which it resembles very closely. The chief difference is in the ability to absorb water. True bentonite will absorb many times its weight in water and swell correspondingly in volume. Ardmorite has all the physical characters of bentonite except this one. It becomes moistened easily, but its volume changes very little.

The clay has chemical properties which make it valuable as a water softener. It is being excavated

Fig. 7. Pits at Ardmore showing the white beds of ardmorite.

at Ardmore (Fig. 7), where a plant with a daily capacity of 3 to 4 tons of processed clay is owned and operated by the Refinite Co. of Omaha (Fig. 8). This plant has been in operation for the past 15 yr., a large part of the production being used by the company in water-softeners of its own manufacture.

*Pumice.*—The trade name pumice is used for a volcanic ash which occurs in the south-central part of South Dakota. It is extremely fine, very pure and is made entirely of volcanic ash. Volcanic ash has been excavated in the edge of the Great Plains in Oklahoma, Kansas, and Nebraska for some time, but the South Dakota deposits were not opened until 1928, when a company in Winner started producing it for use in the manufacture of soap and scouring compounds. This industry has not had time to get fairly under way but promises to develop into a thriving business.

*Feldspar.*—Feldspar, used in the ceramic industries, is produced in the heart of the Black Hills. It occurs as huge crystals in volcanic dikes known as pegmatites. Crystals of feldspar several feet in diameter are mixed in a heterogeneous pile with great crystals of quartz, micas, and a host of unusual and rare minerals. The feldspar is mined in open cuts in the larger mines, but underground

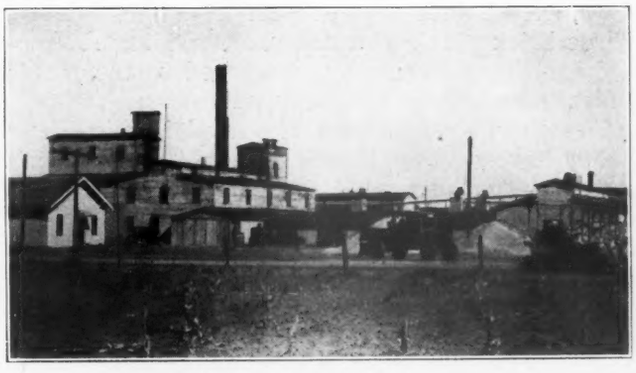


Fig. 8. Plant of the Refinite Co., Ardmore.

mining is resorted to in some of the smaller ones. It is hand sorted and ground before being sent to market. Four mines were producing this mineral in 1930 in the vicinity of Custer and Keystone (Fig. 9). Most of their product was ground in a large mill belonging to the Consolidated Feldspar Co. and located in Keystone.

*Future Development.*—The end is not yet. South Dakota's quarry production is barely started, considered either from the viewpoint of mineral products now in use or of possible future development. Structural and building stones are available as long as man cares to quarry them and in limitless amounts. The Sioux quartzite is over 1,500 ft. thick, and lies near the surface over an area of some 1,500 sq. mi. The extent of the Milbank granite is unknown, but it outcrops over 7 sq. mi. in Grant County, and granite hills with a thin glacial cover are known several miles from these quarries. The bottom of the granite has never been reached, but the character of the rock assures a depth of at least 200 or 300 ft. Thick formations of limestone, sandstone, and other usable rock, obtainable in the Black Hills, make a supply which is practically inexhaustible.

Clays of various kinds occupy one-half to three-quarters of the area of the state. They include materials usable for brick, tile, and pottery, besides the specialized uses such as fullers' earth and the bentonitic clays. Very little use has been made of this resource, and not much is known about the

**Fig. 9. Distant view of the Peerless feldspar workings at Keystone.**

clays, except their general location and abundance. Three brick plants and one plant refining Ardmorite are but a beginning, compared to the plants which this resource could support.

The enormous deposits of gravel in Big Sioux Valley have scarcely been touched. Other deposits equally large lie near Missouri River, and great terraces of sands and gravel are to be found on the bluffs of the major valleys west of the Missouri. Sand and gravel are the most widely distributed structural materials in the state. Good railroad facilities in the neighborhood of many of these deposits give them ready access to market, and favorable sites for washing, screening and loading plants

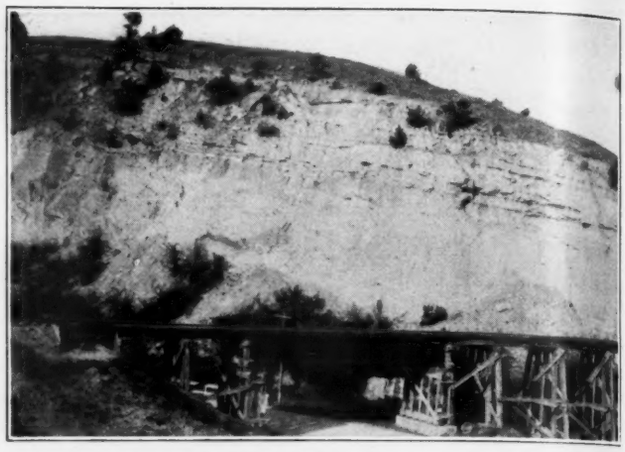


**Fig. 10. Dakota sandstone, Evans Quarry, near Hot Springs.**

make possible the development and maintenance of a large and thriving industry. No estimate has been made on the total amount of gravel in the state. It may be significant, however, that the total yardage estimated from a detailed survey of Minnehaha County gave that one county 353,800,000 cu.yd.

Other nonmetallic-mineral deposits than structural materials lie untouched, or only partly exploited. At least 2,000,000,000 tons of coal can be excavated from the seams in the northwest quarter of the state. Much of it can be reached by strip pits. Only an extremely small part of this resource has been touched, and most of that has been produced for local uses. The feldspar dikes have been worked nearly half a century, but show no signs of exhaustion, and many untouched dikes await development.

These facts offer a bright future for the development of the nonmetallic-minerals industry in the state. The raw materials are there in abundance. The growth of the industry will depend largely upon the initiative and aggressiveness of its operators.

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## Operator Located in Tower Controls Excavating at Gravel Plant

(*Continued from page 39*)

is located at the base of another wooden building alongside the plant and is driven by a 60-hp. motor through a silent-chain drive. The hoist is controlled by levers from a tower room on the top of this building, from which the operator can see all operations. This building also houses the plant office and a storeroom.

The crusher is belt-driven by a 50-hp. motor and the primary scalping screen by a 5-hp. motor through a Dayton Cog-Belt drive. The triple-deck sizing screen is also driven through a Dayton Cog-Belt by a 7½-hp. motor. A 15-hp. motor drives the bucket-elevator through inclosed gear and chain and the screw-washer is chain-driven from the same motor. The water pump is driven by a 30-hp. motor. With a few exceptions, General Electric motors are used in this plant. All conduit and outlets were furnished by the Appleton Electric Co.

# MEN OF THE INDUSTRY

The portrait printed on this page in each number of PIT AND QUARRY is selected without significance as to current events or the position of the individual in the industry.

**A. C. AVRIL**
Avril TruBatch Concrete, Inc.
Cincinnati, O.

# Coming Events

**May 5, 1932. Newark, N. J.** Eighth Annual Eastern Safety Conference. F. M. Rosseland, secretary, Newark Safety Council.

**May 10-11, 1932. West Baden Springs, Ind.** Mid-year Board of Directors' Meeting, National Sand & Gravel Assn.

**May 12, 1932. West Baden Springs, Ind.** Mid-year Board of Directors' Meeting, National Ready-Mixed Concrete Assn.

**May 12, 1932. St. Louis, Mo.** Monthly meeting, St. Louis Quarrymen's Assn., Forest Park Hotel. E. J. McMahon, exec. sec., 4063 Forest Park Blvd., St. Louis, Mo.

**May 19, 1932. Erie, Pa.** Seventh Annual Northwestern Pennsylvania Safety Conference. S. M. Lippincott, secretary, Erie Safety Council.

**May 24-25, 1932, Cleveland, O.** Annual Convention, National Lime Assn. Norman G. Hough, president and general manager, 927 Fifteenth St. N. W., Washington, D. C.

**June 20-24, 1932. Atlantic City, N. J.** Annual meeting of American Society for Testing Materials. C. L. Warwick, secretary-treasurer, 1315 Spruce St., Philadelphia, Pa.

**October 3-7, 1932. Washington, D. C.** Twenty-first Annual Safety Congress, National Safety Council. W. H. Cameron, secretary, 20 N. Wacker Drive, Chicago, Ill.

# Pumpings from the Old Pit

*Excerpts from the old files of* PIT AND QUARRY *reveal many interesting sidelights on the activities of the pits, quarries and plants of former days. These are printed in this column each issue.*

## Fifteen Years Ago

TEN tons of dynamite were detonated in the quarry of the American Lime & Stone Co. at Pemberton, Pa., the blast bringing down 140,000 tons of stone. The charges were placed in thirteen holes 165 ft. deep and drilling in preparation for the shot required three months' time. It was said that the blast would provide sufficient stone to keep the company's crushed-stone plant in operation at full time for six months.

* * *

The Greenville Gravel Co. of Greenville, O., operating eight plants in Ohio, Indiana and Michigan, increased its capital stock from $250,000 to $750,000.

## Ten Years Ago

THE Ohio Sand & Gravel Producers Assn., at its annual meeting at Columbus, elected the following officers: F. E. Hall of T. J. Hall & Co., Cincinnati, president; E. A. Evans, Zanesville Washed Gravel Co., Zanesville, vice-president; F. C. Fuller, Portsmouth Sand & Gravel Co., Portsmouth, secretary-treasurer; Guy C. Baker, Greenville Gravel Co., Greenville, secretary.

* * *

Fire of unknown origin partially destroyed the plant of the Wickwire Limestone Co. at Gasport, N. Y. The loss was estimated at $50,000.

* * *

The U. S. Gypsum Co. had plans under way for the erection of additional units at its Oakfield plant near Batavia, N. Y.

The slate industry in Pennsylvania was experiencing a healthy business revival. Many plants and quarries, idle since the war, were being remodeled and reopened.

* * *

The Aetna Portland Cement Co. had started work on the foundations for the buildings at its new plant at Essexville, near Bay City, Mich.

## Five Years Ago

ANNOUNCEMENT was made of the appointment of Prof. Duff A. Abrams as director of research for the International Cement Corp. Mr. Abrams had, for many years previous, been in charge of research for the Portland Cement Assn.

* * *

Following the organization of the Volunteer Portland Cement Co., the concern announced the acquisition of a site near Knoxville, Tenn., where it would shortly begin the erection of a $1,000,000 cement plant.

* * *

One of the first of the electrically-propelled self-unloading limestone boats to be put in service was launched at the shipyards at Lorain, O., when the *Carl D. Bradley* slid down the ways. The vessel was owned by the Bradley Transportation Co. and was to be put in service on the Great Lakes.

* * *

Dwight Morgan, formerly sales manager of the Virginia Portland Cement Corp., was promoted to general manager of the properties. Mr. Morgan succeeded H. E. Hilts, who had gone to Havana to become manager of the Cuban Portland Cement Corp.

# New Incorporations

WHITTEMORE SAND & GRAVEL CO., Boston, Mass. 2,000 shares n.p.v. Alfred I. Merigold, president; Robert E. Eichler, 21 Lyman St., Waltham, Mass., treasurer; Richard S. McSorley.

NORTHERN SAND, GRAVEL & MATERIAL CO., Detroit, Mich., 3233 Barlum Tower. $10,000 preferred and 300 shares common.

SOUTHERN SAND & GRAVEL CO., Muskogee, Okla. Capital $10,000. H. T. Ballantine, R. A. Murray and D. G. Heflin, Jr.

QUARRY PRODUCTS, INC., Cincinnati, O. 250 shares n.p.v. Harry P. Jeffrey, Harries Bldg., Dayton, O.

BREEZY HILL ROCK QUARRY CO., INC., Jeffersonville, Ind. Frank A. Bonenberger, William C. Bowerman, Hattie P. Bonenberger and Nettie V. Bowerman.

RIPPLEMEAD LIME CO., INC., Ripplemead, Va. Capital $15,000. Bernard Mason.

HAEUSSER CONCRETE PRODUCTS CO., Buffalo, N. Y. Capital $100,000. O. C. Joslin.

MOSS CHEMICAL CO., Masonic Bldg., Dalton, Ga. Will develop talc deposits near Chatsworth, Ga.

## Producer's Hobby Yields Volume of New Business

An unusual specialty, started as a hobby, has been built into a considerable business by William Schneider, a sand-and-gravel producer of Elgin, Ill. He started by building a rock garden for himself, using a peculiar formation of stone found on his place as a background, and his own sand and gravel as the aggregates for the lily pool.

He now imports unusual rock from nearly every section of the country. Quite a reputation for his products has been built up in the suburbs around Chicago. In order to maintain complete stocks of other materials necessary for rock gardens, Mr. Schneider maintains a hatchery for gold fish and propagates his own water-lilies, sedum, and other rock-garden plants.

His rock-garden exhibit won first prize in the 1932 Flower Show in Chicago for the second consecutive year. The picture of his winning display of 1931, published in a recent issue of PIT AND QUARRY, brought Mr. Schneider specimens of unusual rock from all over the country, and letters from operators asking for details about his business.

# Personal Mention

**H. E. Kerby** has been appointed sales manager of the Lone Star Cement Co., Pennsylvania, succeeding **R. J. Mahon**, who has been transferred to the headquarters of the parent company, International Cement Corp., at New York, N. Y.

**Louis J. Brunel,** vice-president and general manager of the Bishop Oil Corp. of San Francisco, has been elected to the board of directors of the Calaveras Cement Co., succeeding Frank L. Taylor, at the annual meeting of the stockholders of the company held recently. No changes were made in the officers of the company, **William Wallace Mein** remaining as president.

**Raymond B. Ladoo,** formerly with the United States Gypsum Co. at Chicago, Ill., has resigned to open an office for private practice in Belmont, Mass. Mr. Ladoo will specialize in sales problems and consulting work in nonmetallic minerals.

**D. B. Frisbie,** veteran Barber-Greene salesman, has been appointed branch manager of the Pittsburgh office of The Barber-Greene Co. of Aurora, Ill., manufacturer of standardized material-handling machinery. Mr. Frisbie has been with the company since 1918, and was the first salesman taken on after the company organized. He opened the first Barber-Greene branch office in Cleveland, Ohio. In his long service he has been Eastern sales manager, Southern sales manager and field sales manager.

**Vernon Wright** who has been connected with the Sampsel, Mo., plant of the Cooley Gravel Co., has gone to De Ridder, La., where he will be employed at the new sand-and-gravel plant recently opened by the Cooley concern.

**J. C. Geyer** has completed the foundations for machinery and the erection of storage bunkers at his new sand-and-gravel plant located along the San Lorenzo River near Santa Cruz, Cal. A crusher and screening equipment will be installed shortly, he reports.

**James MacDonald,** who has spent many years with the Lakewood Engineering Co. in the developing and sale of Lakewood equipment, and who, for the past three years, has been working out of the Columbus office, specializing in black top and concrete finishing, has now affiliated himself with The W. T. Walsh Equipment Co. of Cleveland and will handle all of the Lakewood equipment in the northeastern territory of Ohio.

**Carroll Low,** vice-president and general manager of the Monolith Portland Cement Co., has formed a syndicate which has acquired the gold-mining properties known as the Banner Mine near Oregon Gulch, Cal. The Banner, a quartz operation, has been producing for many years and is said to have yielded $4,000,000 of metal during its existence.

**S. L. Dennis** has sold his sand and gravel business at Raymond, Wash., to **Bruce Dennis,** who will continue its active operation.

**Duane S. Tomlinson** has become sole owner of the Burt County Gravel Co. of Tekamah, Neb., having purchased the interest in the business from his partner, **David Narcoe.**

**Curtis Read** of Phoenix, Ariz., has been appointed sales representative for Arizona by the Monolith Portland Cement Co. of Los Angeles.

**Fred A. Gill,** formerly of the Gill Rock Drill Co., of Lebanon, Pa., has become associated with the Armstrong Manufacturing Co., of Waterloo, Ia. Mr. Gill is widely known as an expert on drilling problems and has been closely identified with quarry developments for years, particularly in the crushed-stone and cement industries in the United States, Canada, and in Central and South America. Mr. Gill is making his headquarters at the Eastern offices of the Armstrong company which are located at 1506 Mayflower St., Harrisburg, Pa.

**James S. Watson,** formerly vice-president in charge of Link-Belt Company's Dodge Works, Indianapolis, has been appointed vice-president and general manager of both the Dodge and the Ewart Works, the company's two Indianapolis chain factories, thus succeeding **George P. Torrence,** who was recently elevated to the presidency. **Frank S. O'Neil,** heretofore manager of the company's Ewart Works, has been appointed assistant general manager of both Indianapolis plants. **C. Walter Spalding,** who has been connected with the Ewart Works for a number of years, has been appointed sales manager of Ewart plant products.

**J. E. Polhemus** has been appointed district sales manager, in charge of the Detroit territory by the Babcock & Wilcox Tube Co., Beaver Falls, Pa. A new branch office in the Ford Bldg., Detroit, will serve as his headquarters. Mr. Polhemus was formerly assistant vice-president and district sales manager of the Detroit sales branch of the Associated Alloy Steel Co. of Cleveland, O.

**W. E. Welty,** who has been a divisional manager of the United States Gypsum Co. at its Chicago headquarters, has been transferred to the company's plant at Gypsum, O., where he has been made works manager. Mr. Welty and his family have moved to Gypsum and taken up residence there. **Richard Hess** has been made manager of the sample and specialty departments at Gypsum.

**Charles Harvey** has opened a small gravel pit near Rockfield, Ind., to supply material to be used in the paving of State Highway No. 25 between Delphi and Logansport, Ind.

**Harold Smith,** vice-president of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has been elected a director of the Radio Corp. of America, New York, N. Y.

## Obituary

**Henry W. Thuennen,** 34 years old, vice-president and secretary of the Davenport Concrete Products Co., of Davenport, Ia., died recently following a brief illness. Death was due to pneumonia. He is survived by a widow and two children.

**T. J. Schott,** aged 53, president of the Wausau Sand & Gravel Co. and vice-president of the Wausau Concrete Co., died at his home in Wausau after an illness of four months. Two sons and a widow survive.

**John Creighton,** senior member of the firm of J. A. Creighton & Co., lime producers for three-quarters of a century at Thomaston, Me., died recently at Thomaston, his native city. He was 75 years old and was the son of Capt. James A. Creighton, veteran master of sailing ships in the days gone by, who founded the lime concern about 1855 after he retired from the sea. Mr. Creighton is survived by his widow, two daughters, one son John, junior member of the firm, and one brother and a sister.

**William Newton Agnew,** traffic manager of the Worthington Pump & Machinery Corp., New York, since 1910, and also assistant to the president for the past three years, died suddenly April 12 at his home in New York. His widow, Mary Aldrich Agnew, whom he married in 1899, and a daughter survive him. Mr. Agnew was born in Seymour, Ind., April 26, 1876. In 1910 he became traffic manager of the International Steam Pump Co., and succeeded to the same position upon the organization of the Worthington Pump & Machinery Corp. in 1916.

# Latest Portland-Cement Statistics

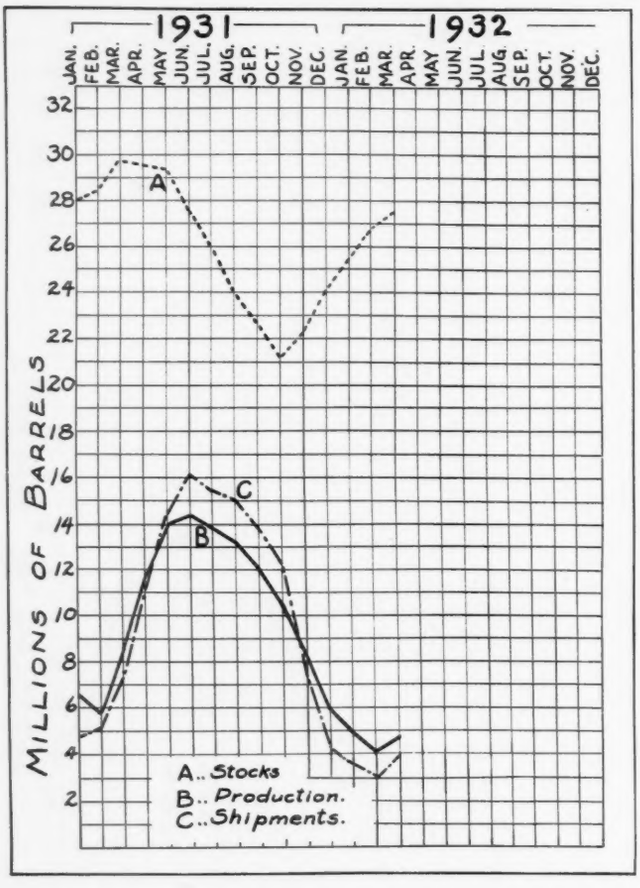

1931
1932
JAN. FEB. MAR. APR. MAY JUN. JUL. AUG. SEP. OCT. NOV. DEC.
JAN. FEB. MAR. APR. MAY JUN. JUL. AUG. SEP. OCT. NOV. DEC.
MILLIONS OF BARRELS
32 30 28 26 24 22 20 18 16 14 12 10 8 6 4 2
A
B
C
A.. Stocks
B.. Production.
C..Shipments.

Chart showing monthly production, shipments and stocks on hand at end of month, from January, 1931, to March, 1932.

THE Portland-cement industry in March, 1932, produced 4,847,000 bbl., shipped 3,973,000 bbl. from the mills, and had in stock at the end of the month 27,530,000 bbl. Production of Portland cement in March, 1932, showed a decrease of 41.2 per cent. and shipments a decrease of 44 8 per cent. as compared with March, 1931. Portland-cement stocks at the mills were 7.2 per cent. lower than a year ago.

In the statement of relation of production to capacity the total output of finished cement is compared with the estimated capacity of 165 plants both at the close of March, 1932, and of March, 1931. The estimates include increased capacity due to extension and improvements during the period.

**DISTRIBUTION OF CEMENT**

| Shipped to— | January | | February | |
|---|---|---|---|---|
| | 1931 | 1932 | 1931 | 1932 |
| Alabama | 88,798 | 29,065 | 103,610 | 27,589 |
| Alaska | 11 | 132 | 159 | 0 |
| Arizona | 36,015 | 12,426 | 36,834 | 8,383 |
| Arkansas | 54,904 | 19,588 | 43,685 | 22,280 |
| California | 580,888 | 371,260 | 532,384 | 301,852 |
| Colorado | 20,937 | 13,598 | 32,603 | 18,392 |
| Connecticut | 40,081 | 37,618 | 40,716 | 24,687 |
| Delaware | 10,916 | 13,150 | 15,566 | 12,842 |
| District of Columbia | 53,960 | 59,606 | 56,388 | 70,548 |
| Florida | 64,038 | 27,586 | 60,601 | 27,805 |
| Georgia | 83,687 | 100,950 | 81,500 | 92,049 |
| Hawaii | 24,971 | 16,983 | 28,265 | 15,765 |
| Idaho | 4,465 | 2,359 | 7,472 | 2,987 |
| Illinois | 195,146 | 103,901 | 227,023 | 109,850 |
| Indiana | 79,310 | 48,366 | 108,914 | 59,591 |
| Iowa | 30,333 | 22,943 | 73,262 | 20,162 |
| Kansas | 70,951 | 27,495 | 111,835 | 36,309 |
| Kentucky | 56,581 | 44,852 | 73,215 | 47,017 |
| Louisiana | 133,695 | 77,633 | 156,356 | 62,045 |
| Maine | 8,263 | 6,847 | 9,015 | 4,513 |
| Maryland | 48,532 | 87,662 | 71,391 | 57,752 |
| Massachusetts | 106,524 | 87,756 | 69,184 | 67,952 |
| Michigan | 174,367 | 92,394 | 170,815 | 96,588 |
| Minnesota | 46,987 | 31,018 | 62,726 | 26,585 |
| Mississippi | 37,644 | 14,040 | 31,532 | 11,977 |
| Missouri | 167,209 | 77,383 | 182,133 | 85,579 |
| Montana | 9,502 | 3,494 | 10,912 | 3,062 |
| Nebraska | 16,464 | 6,897 | 49,142 | 11,655 |
| Nevada | 2,455 | 10,308 | 6,231 | 12,238 |
| New Hampshire | 6,586 | 7,667 | 7,359 | 4,638 |
| New Jersey | 135,679 | 165,341 | 151,941 | 127,933 |
| New Mexico | 12,200 | 6,292 | 14,839 | 14,749 |
| New York | 653,705 | 590,166 | 622,266 | 469,466 |
| North Carolina | 30,352 | 37,779 | 42,771 | 36,507 |
| North Dakota | 2,737 | 942 | 5,790 | 1,395 |
| Ohio | 188,631 | 161,775 | 219,903 | 171,138 |
| Oklahoma | 115,140 | 81,230 | 125,682 | 94,218 |
| Oregon | 36,696 | 26,097 | 38,148 | 26,001 |
| Pennsylvania | 323,776 | 251,407 | 343,903 | 224,350 |
| Porto Rico | 620 | 2,725 | 1,020 | 1,751 |
| Rhode Island | 13,249 | 22,151 | 11,454 | 8,594 |
| South Carolina | 170,545 | 33,652 | 208,443 | 30,897 |
| South Dakota | 6,533 | 3,721 | 21,300 | 3,503 |
| Tennessee | 65,246 | 36,629 | 56,391 | 36,126 |
| Texas | 327,904 | 255,469 | 309,196 | 285,206 |
| Utah | 6,075 | 6,730 | 13,991 | 6,402 |
| Vermont | 2,869 | 2,937 | 2,014 | 4,618 |
| Virginia | 61,804 | 64,365 | 81,003 | 57,936 |
| Washington | 110,948 | 45,904 | 129,223 | 45,674 |
| West Virginia | 52,512 | 45,752 | 56,430 | 47,007 |
| Wisconsin | 66,531 | 54,214 | 85,088 | 46,972 |
| Wyoming | 4,854 | 1,261 | 5,333 | 2,553 |
| Unspecified | 25,533 | 15,671 | [b]23,271 | 0 |
| | 4,668,359 | 3,367,187 | 5,030,228 | 3,085,688 |
| Foreign countries | 23,641 | 25,813 | 43,772 | 32,312 |
| Total shipped from cement plants | 4,692,000 | 3,393,000 | 5,074,000 | 3,118,000 |

**EXPORTS OF HYDRAULIC CEMENT BY COUNTRIES IN FEBRUARY, 1932**

| Exported to— | Barrels | Value |
|---|---|---|
| Canada | 286 | $1,571 |
| Central America | 988 | 2,535 |
| Cuba | 797 | 1,224 |
| Other West Indies | 921 | 1,760 |
| Mexico | 2,032 | 5,824 |
| South America | 5,845 | 16,448 |
| Other countries | 2,020 | 9,988 |
| | 12,889 | $39,350 |

**IMPORTS OF HYDRAULIC CEMENT BY COUNTRIES AND BY DISTRICTS, IN FEBRUARY, 1932**

| Imported from— | District into which imported | Barrels | Value |
|---|---|---|---|
| Belgium | Massachusetts | 19,047 | $20,049 |
| Canada | Maine and New Hampshire | 10 | 18 |
| Cuba | Porto Rico | 1,263 | 1,875 |
| Denmark | Porto Rico | 12,524 | 8,196 |
| Japan | Hawaii | 2,575 | 2,122 |
| United Kingdom | New York | 48,287 | 36,937 |
| | Total | 83,706 | $69,197 |

**RELATION OF PRODUCTION TO CAPACITY**

| | March | | February | January | December |
|---|---|---|---|---|---|
| | 1931 (*per cent.*) | 1932 (*per cent.*) | 1932 (*per cent.*) | 1932 (*per cent.*) | 1931 (*per cent.*) |
| The month | 36.9 | 21.3 | 18.7 | 22.0 | 26.4 |
| The 12 months ended | 58.6 | 43.8 | 45.2 | 45.9 | 46.5 |

## PRODUCTION, SHIPMENTS, AND STOCKS OF FINISHED PORTLAND CEMENT, BY MONTHS, IN 1931 AND 1932 (*thousands of barrels*)

| Month | Production | | Shipments | | Stocks at End of Month | |
|---|---|---|---|---|---|---|
| | 1931 | 1932 | 1931 | 1932 | 1931 | 1932 |
| January | 6,695 | 5,026 | 4,692 | 3,393 | 27,759 | 25,778 |
| February | 5,920 | 3,971 | 5,074 | 3,118 | 28,612 | 26,657 |
| March | 8,245 | 4,847 | 7,192 | 3,973 | 29,676 | 27,530 |
| April | 11,245 | ..... | 11,184 | ..... | 29,715 | ..... |
| May | 14,010 | ..... | 14,200 | ..... | 29,554 | ..... |
| June | 14,118 | ..... | 16,077 | ..... | 27,602 | ..... |
| July | 13,899 | ..... | 15,545 | ..... | 25,934 | ..... |
| August | 13,549 | ..... | 15,172 | ..... | 24,313 | ..... |
| September | 12,092 | ..... | 13,671 | ..... | 22,736 | ..... |
| October | 10,762 | ..... | 12,360 | ..... | 21,218 | ..... |
| November | 8,161 | ..... | 7,156 | ..... | 22,219 | ..... |
| December | 5,974 | ..... | 4,142 | ..... | a/24,098 | ..... |
| Totals | 124,570 | ..... | 126,465 | ..... | ..... | ..... |

## PRODUCTION AND STOCKS OF CLINKER, BY DISTRICTS, In MARCH, 1931 and 1932 (*thousands of barrels*)

| District | Production | | Stocks at end of Month | |
|---|---|---|---|---|
| | 1931 | 1932 | 1931 | 1932 |
| Eastern Pa., N. J., and Md. | 2,489 | 1,560 | 1,893 | 1,232 |
| New York and Maine | 669 | 635 | 1,314 | 793 |
| Ohio, Western Pa., and W. Va. | 623 | 229 | 1,645 | 1,107 |
| Michigan | 382 | 214 | 1,852 | 979 |
| Wis., Ill., Ind., and Ky. | 980 | 954 | 1,741 | 1,381 |
| Va., Tenn., Ala., Ga., Fla., and La. | 962 | 240 | 897 | 736 |
| Eastern Mo., Ia., Minn., and S. Dak. | 1,137 | 365 | 1,006 | 455 |
| W. Mo., Neb., Kan., Okla., and Ark. | 716 | 260 | 871 | 812 |
| Texas | 430 | 330 | 300 | 267 |
| Colo., Mont., Utah, Wyo., and Idaho. | 203 | 0 | 287 | 150 |
| California | 813 | 606 | 1,085 | 1,724 |
| Oreg. and Wash. | 182 | 50 | 427 | 377 |
| Totals | 9,586 | 5,443 | 13,318 | 10,013 |

## PRODUCTION, SHIPMENTS, AND STOCKS OF FINISHED PORTLAND CEMENT, BY DISTRICTS, IN MARCH, 1931 AND 1932, AND STOCKS IN FEBRUARY, 1932 (*thousands of barrels*)

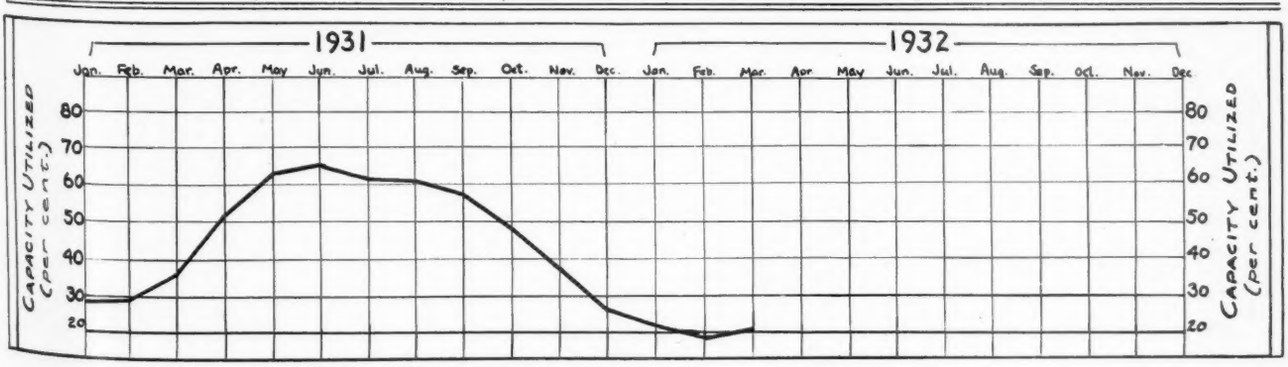
| District | March | | | | | | Stocks at End of February 1932 |
|---|---|---|---|---|---|---|---|
| | Production | | Shipments | | Stocks at End of Month | | |
| | 1931 | 1932 | 1931 | 1932 | 1931 | 1932 | |
| Eastern Pa., N. J., and Md. | 2,293 | 1,509 | 1,724 | 978 | 6,622 | 6,237 | 5,706 |
| New York and Maine | 437 | 570 | 381 | 237 | 2,013 | 1,909 | 1,575 |
| Ohio, Western Pa., and W. Va. | 444 | 241 | 595 | 269 | 3,565 | 3,377 | 3,405 |
| Michigan | 72 | 53 | 286 | 128 | 2,600 | 2,017 | 2,093 |
| Wis., Ill., Ind., and Ky. | 797 | 688 | 526 | 256 | 4,237 | 3,817 | 3,386 |
| Va., Tenn., Ala., Ga., Fla., and La. | 942 | 300 | 1,061 | 448 | 1,714 | 1,601 | 1,749 |
| Eastern Mo., Ia., Minn., and S. Dak. | 869 | 325 | 494 | 243 | 3,833 | 3,808 | 3,726 |
| W. Mo., Neb., Kan., Okla., and Ark. | 638 | 251 | 520 | 288 | 2,196 | 1,905 | 1,942 |
| Texas | 489 | 304 | 456 | 380 | 773 | 771 | 847 |
| Colo., Mont., Utah, Wyo., and Idaho. | 192 | 39 | 126 | 64 | 552 | 431 | 456 |
| California | 830 | 521 | 770 | 547 | 998 | 1,098 | 1,124 |
| Oreg. and Wash. | 242 | 46 | 253 | 135 | 573 | 559 | 648 |
| Totals | 8,245 | 4,847 | 7,192 | 3,973 | 29,676 | 27,530 | 26,657 |

## EXPORTS AND IMPORTS OF HYDRAULIC CEMENT, BY MONTHS, IN 1931 AND 1932

| Month | Exports | | | | Imports | | | |
|---|---|---|---|---|---|---|---|---|
| | 1931 | | 1932 | | 1931 | | 1932 | |
| | Barrels | Value | Barrels | Value | Barrels | Value | Barrels | Value |
| January | 41,199 | $115,678 | 36,704 | $82,984 | 95,609 | $120,298 | 14,375 | $16,648 |
| February | 25,703 | 88,989 | 12,889 | 39,350 | 21,984 | 25,391 | 83,706 | 69,197 |
| March | 54,599 | 144,579 | ..... | ..... | 70,378 | 80,360 | ..... | ..... |
| April | 40,478 | 116,564 | ..... | ..... | 53,333 | 58,576 | ..... | ..... |
| May | 48,028 | 140,953 | ..... | ..... | 19,325 | 20,568 | ..... | ..... |
| June | 43,597 | 107,610 | ..... | ..... | 32,079 | 42,955 | ..... | ..... |
| July | 29,344 | 97,837 | ..... | ..... | 14,332 | 15,582 | ..... | ..... |
| August | 39,517 | 106,643 | ..... | ..... | 8,895 | 11,739 | ..... | ..... |
| September | 27,570 | 81,399 | ..... | ..... | 33,574 | 33,520 | ..... | ..... |
| October | 24,531 | 68,524 | ..... | ..... | 39,642 | 42,380 | ..... | ..... |
| November | 33,200 | 97,796 | ..... | ..... | 27,940 | 22,235 | ..... | ..... |
| December | 21,887 | 54,028 | ..... | ..... | 40,147 | 34,314 | ..... | ..... |
| Totals | 429,653 | 1,220,600 | ..... | ..... | 457,238 | 507,918 | ..... | ..... |

## PRODUCTION AND STOCKS OF CLINKER BY MONTHS, IN 1931 AND 1932 (*thousands of barrels*)

| Month | Production | | Stocks End of Month | | Month | Production | | Stocks End of Month | |
|---|---|---|---|---|---|---|---|---|---|
| | 1931 | 1932 | 1931 | 1932 | | 1931 | 1932 | 1931 | 1932 |
| January | 8,129 | 6,107 | 10,384 | 8,184 | July | 12,246 | ..... | 10,209 | ..... |
| February | 7,473 | 5,176 | 11,946 | 9,375 | August | 11,664 | ..... | 8,468 | ..... |
| March | 9,586 | 5,443 | 13,318 | 10,013 | September | 10,414 | ..... | 6,918 | ..... |
| April | 11,540 | ..... | 13,854 | ..... | October | 9,825 | ..... | 6,021 | ..... |
| May | 13,159 | ..... | 13,087 | ..... | November | 8,259 | ..... | 6,215 | ..... |
| June | 12,679 | ..... | 11,837 | ..... | December | 6,840 | ..... | 7,035 | ..... |




Production capacity utilized by months, January, 1931, to March, 1932.

# Traffic News and Comment

## Recent I. C. C. Decisions

*Returned Empty Cement Bags.*—While the rate on returned empty cement bags, in bundles, in less-than-carload shipment, from Minneapolis, Minn., to Davenport, Ia., was found to be applicable and not unreasonable, the weight applied was found to be inapplicable to the extent of 1,769 lb., and reparation of $10.79 awarded.—I. C. C. Docket No. 24,727.

## Examiners' Reports

*Cement.*—Motor-truck competition is cited as a reason why the commission should reverse a former decision. In the Iola Cement Mills Case, 172 I. C. C. 684, the commission found that the rates on cement from Portland and Boettcher, Colo., and Laramie, Wyo., to destinations in Colorado and Wyoming were unduly preferential of shippers at these points and unduly prejudicial to shippers at Dewey, Okla., Chanute, Humboldt, Fredonia, Iola, Independence and Mildred, Kan., points in the so-called Kansas "gas belt." Rates prescribed in this decision were based on the average of Cement Scales III and IV. Shippers located in the Kansas "gas belt" are complainants, and those located at the Colorado and Wyoming points, interveners. In the report made by Examiner Thurston B. Johnston in the reopened case, he says: "The record is clear that if the increased rates are allowed to go into effect, the interveners will truck their own cement. It was testified that if the Colorado plants were forced to resort to trucking, it would ultimately result in a closing of the Portland mill as the Boettcher mill can more than supply the territory's needs. The complainants offered no rebuttal testimony relating to the trucking situation, but show that the testimony of the interveners and defendants relates only to the matter of potential truck competition. On their brief they state that no cement has been trucked to Denver from the Colorado or Wyoming mills, and that the Laramie mill has not trucked any cement, notwithstanding the fact that a higher level of rates applies to Nebraska than to the Wyoming-Colorado territory intermediate to Denver. However, they further state on their brief that it is not the desire of these complainants that any railroad should lose freight traffic to trucks. It is the position of the complainants that if lower than reasonable maximum rates are necessary in order that cement tonnage may continue to move by rail, it is to the interest of the railroads as well as the shipping public that the railroads be authorized by the commission to make such rates as in its wisdom will retain the traffic for the rail carrier. The element of truck competition also enters into the situation in respect of unjust discrimination as against interstate commerce. The theory of that provision is that intrastate rates should not be permitted on a basis lower than interstate rates found reasonable for the same distance if the maintenance of such lower rates endangers the financial condition of the carriers in their entire operation. But in Florida *v.* United States, 282 U. S. 194, the Supreme Court took notice of the fact that the general revenue situation would not be improved by enforced increases in intrastate rates if the result would be a diversion of traffic to the motor trucks.

"The circumstances recited raise this question: Does the existence of truck competition and the imminent threat of the loss of this traffic to the rail carriers justify continued maintenance of the present rates? The interveners are not alone in their defense of their rates. The carriers seriously urge upon the commission the necessity of continuing the rates.

"There is no showing that the traffic from the Kansas 'gas-belt' mills is subject to the same, or to any, truck competition.

"A preference and prejudice to be unlawful must be undue, and it is not undue unless the resulting injury will cease upon removal of the alleged prejudice, regardless of the manner of its removal. (City of Morehead *v.* Great Northern, 172 I. C. C. 38.) If the rates from the interveners' mills be increased to the level proposed in the prior report, the traffic will undoubtedly go to the trucks at rates relatively lower than those assailed, whereupon the complaining shippers would be in no better position to compete with the interveners. It may be said in this connection, as contended by the complainants, that the truck competition is not actual but merely potential, but the commission should not force the defendants to lose this traffic before first adopting measures for them to retain it.

"Upon this record the commission should find that the rates assailed are not unreasonable, and that the maintenance of the rates assailed from Portland, Boettcher and Laramie to the destination territory in Colorado and Wyoming, lower mile for mile than corresponding rates from the complaining points, does not create undue prejudice or unjust discrimination against interstate commerce. The complaint should be dismissed."—I. C. C. Docket No. 22,020, Iola Cement Mills Traffic Assn. *et al.*, *v.* A. T. & S. F. *et al.*

*Cement.*—Examiner Roy E. McKee recommends that the commission find that the rates sought to be collected on two car-loads of Portland cement, from Humboldt, Kan., to Sumner, Okla., reconsigned in transit at Minco, Okla., applicable and not unreasonable; that the shipments were undercharged $300.60, and that the undercharge should be collected and the complaint dismissed.—I. C. C. Docket No. 24,843, Monarch Cement Co. *v.* A. T. & S. F. *et al.* (PIT AND QUARRY, Dec. 16, 1931, p. 73.)

Examiner W. H. Smith recommends a finding that the rate on Portland cement from Speed, Ind., to Brixment, N. Y., was and is unreasonable to the extent that it exceeded or may exceed 22½c. plus the emergency charges in the Fifteen-Per Cent. Case 1931, and proposes the establishment of a new rate and the award of reparation in I. C. C. Docket No. 24,599, Louisville Cement Co. *v.* C. C. C. & St. L. *et al.*

*Fluxing Stone.*—Examiner Wm. B. Wilbur recommends finding that the rates on crude, fluxing, foundry or furnace limestone, from Stephens City, Va., to destinations in Maryland, Pennsylvania, West Virginia, Ohio and Delaware, are unreasonable, unduly prejudicial to the complainant and unduly preferential of its competitors at Martinsburg and Engle, W. Va., to the extent that they exceeded or may exceed rates from Martinsburg and Engle.—I. C. C. Docket No. 24,823, M. J. Grove Lime Co. *v.* B. & O. *et al.*

## New Complaints Filed

*Cement.*—Charges in violation of Sec. 1 and 15 on Portland cement from Dewey, Okla., to points in Texas are alleged and new rates and reparation sought in I. C. C. Docket No. 25,124, Dewey Portland Cement Co., Kansas City, Mo. *v.* A. T. & S. F. *et al.*

*Crushed Stone, Sand and Gravel.*—Rates and charges in violation of Sec. 1 and 3 are complained of on shipments of crushed stone, sand, gravel and other road-building materials, from Detroit and Ecorse, Mich., to points in Michigan, Indiana and Ohio, shippers in Michigan, Indiana, Ohio and other states being unduly preferred. New rates are asked for in I. C. C. Docket No. 25,156, Basic Dolomite, Inc., *et al.*, Cleveland, O. *v.* A. A. *et al.*

The same allegation as the above, on the same commodities from Michigan and Wisconsin points to the same destinations, with competitors in Michigan preferred, is complained of and new rates sought in I. C. C. Docket No. 25,156, Sub. 1, Construction Materials Corp., Chicago, Ill. *v.* A. A. *et al.*

*Crushed Rock.*—Reparation is sought on an alleged violation of Sec. 1 on the shipment of crushed rock from Klamath Falls, Ore., to Alturas,

Cal., in I. C. C. Docket No. 25,169, Valley Paving & Construction Co., Fresno, Cal. *v.* S. P.

*Lime.*—Violation of Sec. 1, 3 and 4 are alleged in the rates on hydrated lime from Speedway, Ind., to points in C. F. A. territory, competitors at Evansville, Ind., and Alton, Ill., being unduly preferred. New rates and reparation are prayed for in I. C. C. Docket No. 25,114, Lime Products Corp., Indianapolis, Ind. *v.* B. & O. *et al.*

## Rate-Committee Dockets

### New England Freight Assn.

*Sand and Gravel.*—To meet motor-truck competition from local pits carriers propose to reduce the rates on common sand and gravel,[1] from Westboro, N. H., as shown below in Docket No. 25,035.

| To— | Present | Proposed |
|---|---|---|
| E. Ryegate, Vt. ..... | $1.20 | $1.00 |
| McIndoes, Vt. ..... | 1.20 | 1.00 |
| Barnet, Vt. ..... | 1.25 | 1.00 |
| Inwood, Vt. ..... | 1.25 | 1.00 |
| Passumpsic, Vt. .... | 1.25 | 1.00 |

### Trunk-Line Assn.

*Crushed Stone.* — Carriers propose to cancel the commodity rate of 50c. per net ton on crushed stone and screenings,[1] from Ashcom, Pa., to Manns Choice, Pa., when in lots of 10 cars or more at one time, and apply in lieu thereof a rate of 60c. per net ton when shipped in lots of less than 10 cars.—Docket No. 29,000.

*Gypsum Rock.*—Carriers propose to publish a rate of $2.50 per net ton on crude gypsum rock,[1] from Akron, Oakfield, Wheatfield, Clarence Centre, Transit and Garbutt, N. Y., to Greensand, N. J.—Docket No. 28,886, Sup. 1.

*Sand.*—Carriers propose to increase the rate on sand in open-top cars without tarpaulin or other protective covering,[1] from Mapleton District, Pa., to Diamond Smokeless Collieries Nos. 1 and 2, Pa., from $1 to $1.10 per net ton, to conform to the scale prescribed in P. S. C. of Pa., Docket No. 7,950.—T. L. A. Docket No. 28,985

### Central Freight Assn.

*Cement.* — Carriers propose to reduce the rate on cement, car-load minimum weight 100,000 lb., from Detroit, Mich., to Buffalo, N. Y., from 13½c. to 6.8c. per 100 lb., to expire Nov. 30, 1932.—Docket No. 31,076.

*Crushed Stone.* — Carriers propose to establish rates on crushed stone and related articles in open-top cars, from Bluffton, Ind., to points in Michigan. Representative proposed rates are to: Constantine, White Pigeon, $1.17; Florence, Three Rivers, Moorepark, Flowerville, $1.22; Schoolcraft, $1.25; Portage, $1.27; Kalamazoo, Cooper, Argenta, $1.30; Plainwell, Otsego, $1.32; Abronia, Allegan, Miner Lake, $1.35; Hopkins, Hilliards, $1.37; Dorr, Herps, Byron Center, Wentworth, $1.40; Grand Rapids, $1.42 per net ton. Route via N. K. P., Ft. Wayne, N. Y. C.—Docket No. 31,107.

*Dolomite.*—Shippers at Gibsonburg and Woodville, O, propose the establishment of a commodity rate on raw or crude dolomite, to Zanesville, O., of $1.13 per gross ton.—Docket No. 31,102.

*Sand and Gravel.*—Shippers propose that the rate of sand and gravel from Columbus, Ind., to Sunman, Ind., be reduced from 92c. to 86c., and to Aurora, Ind., from $1.05 to 99c. per net ton.—Docket No. 31,059.

Shippers at Hern, Ind., propose that the rate on sand and gravel to Crawfordsville, Ind., be reduced from 70c. to 65c. per net ton.—Docket No. 31,-112.

Carriers propose to reduce the rate on common sand and gravel from Hugo, O., to Cleveland, O., from 60c. to 54½c. per net ton.—Docket No. 31,113.

### Illinois Freight Assn.

*Sand.*—It is proposed to reduce the rate on sand, car-load minimum weight, the marked capacity of the car, from Pekin, Alton, Lincoln and Mackinaw, Ill., to Springfield, Ill., from 70c. to 50c. per net ton.—Docket No. 3,718-I.

*Sand and Gravel.* — In lieu of the present class and combination rates, it is proposed to publish rates on sand and gravel, car-load minimum weight the marked capacity of the car, from Brookport, Ill., to points on connecting lines in Illinois, the same as now apply from Metropolis, Ill., to points on connecting lines in I. C. Tariff 13,-321-G.—Docket No. 6,571.

### Western Trunk Line Committee

*Limestone.* — On crushed or ground limestone from Valmeyer, Ill., to Colorado common points the car-load minimum weight is 90 per cent. of the marked capacity of the car, but not less than 40,000 lb. Shippers propose that this be changed to car-load minimum weight 60,000 lb.—Docket No. 6,025-G.

*Roasted Dolomite.*—A reduction in the rate on roasted dolomite, car-load minimum weight, the marked capacity of the car, except that when the car is loaded to its full cubical or visible capacity the actual weight will apply, but in no case will the minimum weight be less than 40,000 lb., from Chicago, Ill., to Omaha, Neb., from 21c. to 17c. per 100 lb.—Docket No. 1,241-C.

### Southern Freight Assn.

*Ground Limestone or Marble.*—It is proposed to establish a scale of rates for application on shipments of crushed, granulated, ground or pulverized limestone or marble, including stone dust, pulverized to such fineness as will pass through a screen of 5/16-in. mesh, in bulk or in bags, car-load minimum weight 60,000 lb., between points in S. F. A. territory. The suggested rates are to expire one year from the effective date. The differentials now applicable in connection with short or relief lines, also the Florida arbitraries applicable in connection with the present rates, are to be continued and will be added to the basic scale. A statement of the proposed scale will be furnishd on request.—Docket No. 57,499.

### Southwestern Freight Bureau

*Crushed Stone, Sand and Gravel.*—Carriers propose to amend the tariffs naming rates on crushed stone, sand, gravel and other low-grade heavy-loading commodities between points in S. W. F. B. territory and between points in S. W. F. B. and points in W. T. L. territories by making the car-load minimum weight the marked capacity of the car, except that when the car is loaded to its full cubical or visible capacity the actual weight will apply. The car-load minimum weight is now generally 90 per cent. of the marked capacity with the usual provision for full loading. Proponent carrier states that it is unquestionably a waste of car capacity to use the 90-per cent. minimum.—Docket No. 24,535.

[1] The carload minimum weight will be 90 per cent. of the marked capacity of the car, except that, when the car is loaded to its full cubical or visible capacity, the actual weight will apply.

# Suspension Sought on Higher Freight Rates Proposed for Alabama Lime

THE Birmingham Traffic Assn., representing a major portion of the commercial and industrial interests of the Birmingham district has, through its manager, Charles E. Jones, petitioned the Interstate Commerce Commission for a suspension of the proposed and now published new system and level of rates on lime, car-load, from points in Southern territory to destinations in Southwestern territory. This new rate is published to become effective April 29, 1932, and suspension is asked pending hearing and investigation.

Following are the present rates per net ton on lime of the Alabama group to various points in the State of Louisiana, as well as the carriers' proposed rates:

| To— | Present Rate | Carriers' Proposed Rate |
|---|---|---|
| Advance ..... | $4.70 | $6.20 |
| Alexandria ..... | 4.70 | 6.60 |
| Bastrop ..... | 4.68 | 6.00 |
| Broussard ..... | 5.39 | 6.60 |
| Carencro ..... | 5.39 | 6.60 |
| Cedar Grove..... | 6.14 | 6.60 |
| Crowley ..... | 5.69 | 6.80 |
| Donaldsonville ..... | 5.19 | 6.40 |
| Eunice ..... | 5.69 | 6.80 |
| Hodge ..... | 4.70 | 6.20 |
| Jeanerette ..... | 5.39 | 6.60 |
| Jefferson Island..... | 5.69 | 6.60 |
| LaFayette ..... | 5.39 | 6.60 |
| Lake Charles..... | 5.69 | 7.20 |
| Monroe ..... | 4.70 | 6.00 |
| Napoleonville ..... | 4.69 | 6.40 |
| Opelousas ..... | 5.39 | 6.60 |
| Shreveport ..... | 4.70 | 6.60 |
| Thibodaux ..... | 4.69 | 6.40 |
| Ville Platte..... | 7.59 | 6.80 |

(Plus emergency charge of 20c. per ton.)

It will be observed from the above comparisons that the carriers' proposed and published basis of 17½ per cent. on lime, car-load, minimum

weight 30,000 lb., will advance substantially the rates from Alabama points of shipment to points in Louisiana. The points shown are important consuming points in so far as the various manufacturers are concerned, and if the increases are permitted to become effective, it will, in the opinion of the manufacturers, virtually prohibit the movement from these shipping points to points west of Mississippi River.

This revision appears to be a part of a general realignment of the freight rates on commodities moving to, from and within Southwestern territory, including the interterritorial rates between the South on the one hand and points in the Southwest on the other. It is a known fact that the commission has prescribed, and that the carriers have voluntarily adopted, on a large number of commodities a system of rates related to the first-class rates or a percentage of the going first-class rates. Within Southern territory the system of using commodity mileage scales instead of relating the rates to first class has been adopted on a large number of commodities, which in this instance is lime, a basic commodity. It is pointed out that there are good and sufficient reasons, based upon precedent and facts, as to why the rates on lime from points in Southern territory to points in Southwestern territory should not, in all instances, be made rigidly 17½ per cent. of the current first-class rates.

Distance, though a most important factor, is not, alone, to be considered the controlling factor. At present the important going rates from Alabama points to points west of Mississippi River in Southwestern territory, particularly the state of Louisiana, in which state interest is herein centered, the rates to-day apply from all producing points located within a reasonable radius of the Birmingham industrial district. There follow the lime-producing points located in Alabama which are accorded, under the existing adjustment to the Southwest, the same through rates: Calera, Graystone, Keystone, Landmark, Longview, Newala, Pelham, Roberta, Saginaw, Vernons, and Wilmay.

The rates on lime within Southern territory, and the existing rates represent a treated adjustment under the Fourth Section of the Act, as related to the first-class rates prescribed in the Southern Class Rate Investigation, are shown below for representative distances:

| Miles | Southern Rate 30,000 Lb. | Southern Rate 50,000 Lb. | 1st Class Southern | Per Cent. Lime 30,000 to 1st Class | Per Cent. Lime 50,000 to 1st Class |
|---|---|---|---|---|---|
| 100 | 240 | 192 | 76 | 15.8 | 12.6 |
| 200 | 290 | 232 | 102 | 14.2 | 11.3 |
| 300 | 340 | 372 | 122 | 14.0 | 11.2 |
| 400 | 360 | 288 | 142 | 12.7 | 11.0 |
| 500 | 390 | 312 | 157 | 12.4 | 10.0 |
| 600 | 410 | 328 | 172 | 11.9 | 9.5 |
| 700 | 440 | 351 | 187 | 11.8 | 9.4 |
| 800 | 460 | 368 | 202 | 11.4 | 9.1 |

It will, therefore, be observed that the rates proposed within the Southwest and from the South to destinations in the Southwest are actually higher than the adjustment effective on lime within Southern territory. In substantiation of this statement, the following comparisons are shown for representative distances—the Southern scales as compared with the Southwestern proposed level, the latter being determined by using 17½ per cent. of the Southwestern intraterritorial first class scale:

| Miles | Rates Southern Territory: 30,000 Lb. | 50,000 Lb. | Proposed Within and to Southwest Min. 30,000 Lb. |
|---|---|---|---|
| 100 | 240 | 192 | 280 |
| 200 | 290 | 232 | 380 |
| 300 | 340 | 272 | 460 |
| 400 | 360 | 288 | 540 |
| 500 | 390 | 312 | 600 |
| 600 | 410 | 328 | 680 |
| 700 | 440 | 352 | 740 |
| 800 | 460 | 368 | 800 |

The proposed adjustment within, from and to the Southwest is also higher, mile for mile, than the adjust-

(*Continued on page 54*)

**PROGRAMS OF ESTIMATED STATE AND LOCAL HIGHWAY AND BRIDGE EXPENDITURES FOR CALENDAR YEAR 1932**

| State | Grand Total Expenditures on State and Local Roads | Total State Road Expenditures | Expenditures by Local Authorities | Estimated Road Mileage to Be Built by State Highway Departments: Total Mileage | Earth Improved | Sand-Clay, Gravel and Macadam | Asphalt, Concrete and Brick |
|---|---|---|---|---|---|---|---|
| Alabama | $ 8,791,625 | $ 5,291,625 | $ 3,500,000 | 125 | 50 | 75 | ..... |
| Arizona | 8,600,000 | 6,100,000 | 2,500,000 | 360 | 105 | 250 | 5 |
| Arkansas | 10,855,300 | 8,555,300 | 2,300,000 | ..... | ..... | ..... | ..... |
| California | 69,600,000 | 36,400,000 | 33,200,000 | 520 | 50 | 60 | 410 |
| Colorado | 10,426,000 | 7,926,000 | 2,500,000 | 362 | 30 | 306 | 26 |
| Connecticut | 18,572,250 | 15,572,250 | 3,000,000 | ..... | ..... | ..... | ..... |
| Delaware | 4,328,000 | 2,948,000 | 1,380,000 | 100 | ..... | 25 | 75 |
| Florida | 10,139,000 | 8,139,000 | 2,000,000 | ..... | ..... | ..... | ..... |
| Georgia | 20,500,000 | 16,500,000 | 4,000,000 | 850 | 200 | 50 | 600 |
| Idaho | 5,826,250 | 4,326,250 | 1,500,000 | 622 | 8 | 614 | ..... |
| Illinois | 79,080,000 | 51,080,000 | 28,000,000 | 1,000 | ..... | ..... | 1,000 |
| Indiana | 44,975,580 | 28,045,580 | 16,930,000 | 450 | 25 | 25 | 400 |
| Iowa | 40,298,000 | 20,298,000 | 20,000,000 | 1,225 | 350 | 675 | 200 |
| Kansas | 17,350,000 | 13,750,000 | 3,600,000 | 1,243 | 343 | 800 | 100 |
| Kentucky | 27,030,000 | 22,030,000 | 5,000,000 | 950 | 400 | 350 | 200 |
| Louisiana | 39,642,375 | 33,642,375 | 6,000,000 | 2,300 | 300 | 1,400 | 600 |
| Maine | 21,464,420 | 16,464,420 | 5,000,000 | 579 | ..... | 496 | 83 |
| Maryland | 13,458,316 | 10,958,316 | 2,500,000 | 290 | ..... | 90 | 200 |
| Massachusetts | 21,443,000 | 17,443,000 | 4,000,000 | 310 | ..... | 70 | 240 |
| Michigan | 52,560,000 | 30,560,000 | 22,000,000 | 700 | 350 | 100 | 250 |
| Minnesota | 48,500,000 | 32,000,000 | 16,500,000 | 1,130 | 400 | 300 | 430 |
| Mississippi | 4,725,000 | 3,225,000 | 1,500,000 | 50 | 25 | ..... | 25 |
| Missouri | 52,906,300 | 40,906,300 | 12,000,000 | 4,517 | 2,105 | 2,034 | 378 |
| Montana | 11,950,000 | 6,950,000 | 5,000,000 | 900 | 450 | 450 | ..... |
| Nebraska | 18,350,000 | 10,350,000 | 8,000,000 | 1,025 | 100 | 800 | 125 |
| Nevada | 4,323,200 | 3,613,200 | 710,000 | 295 | 31 | 250 | 14 |
| New Hampshire | 8,867,000 | 6,867,000 | 2,000,000 | 150 | ..... | 100 | 50 |
| New Jersey | 67,187,243 | 45,568,601 | 21,618,642 | 128 | 30 | ..... | 98 |
| New Mexico | 5,856,312 | 5,656,312 | 200,000 | 312 | 11 | 295 | 6 |
| New York | 113,642,693 | 63,642,693 | 50,000,000 | 724 | ..... | ..... | ..... |
| North Carolina | 27,103,198 | 18,221,648 | 8,881,550 | 325 | ..... | 250 | 75 |
| North Dakota | 9,232,000 | 5,732,000 | 3,500,000 | 1,870 | 730 | 1,140 | ..... |
| Ohio | 63,500,000 | 33,500,000 | 30,000,000 | 955 | 35 | 150 | 770 |
| Oklahoma | 26,155,159 | 15,084,612 | 11,070,547 | 1,750 | 350 | 1,200 | 200 |
| Oregon | 19,000,000 | 11,000,000 | 8,000,000 | 325 | 150 | 170 | 5 |
| Pennsylvania | 118,830,000 | 68,830,000 | 50,000,000 | 2,700 | ..... | 2,600 | 100 |
| Rhode Island | 5,307,540 | 4,307,540 | 1,000,000 | 40 | ..... | ..... | 40 |
| South Carolina | 13,550,000 | 8,550,000 | 5,000,000 | ..... | ..... | ..... | ..... |
| South Dakota | 10,230,000 | 6,230,000 | 4,000,000 | 718 | 290 | 400 | 28 |
| Tennessee | 14,550,000 | 10,050,000 | 4,500,000 | 180 | 20 | 10 | 150 |
| Texas | 60,000,000 | 45,050,000 | 14,950,000 | 2,500 | 1,325 | ..... | 1,175 |
| Utah | 5,675,000 | 4,475,000 | 1,200,000 | 454 | 20 | 427 | 7 |
| Vermont | 5,837,500 | 5,087,500 | 750,000 | 160 | 30 | 85 | 45 |
| Virginia | 23,780,000 | 18,780,000 | 5,000,000 | 633 | 31 | 404 | 198 |
| Washington | 24,000,000 | 12,000,000 | 12,000,000 | 591 | 142 | 357 | 92 |
| West Virginia | 24,445,000 | 16,945,000 | 7,500,000 | 479 | 230 | 132 | 117 |
| Wisconsin | 33,760,000 | 17,760,000 | 16,000,000 | 523 | 73 | 104 | 346 |
| Wyoming | 6,634,000 | 5,134,000 | 1,500,000 | 675 | 210 | 465 | ..... |
| Totals | $1,352,837,261 | $881,546,522 | $471,290,739 | 36,095 | 8,999 | 17,509 | 8,863 |

# Financial News

*The information contained in these financial pages is given with the understanding that any statement on the part of this magazine or any of its staff, as to the responsibility or standing of any person, firm or corporation, or as to the value of any property or securities is a mere expression of opinion, given as a matter of service to the readers of* PIT AND QUARRY, *for which no responsibility in any way is to attach to this magazine or to any of its staff.*

## Construction Materials Earns $2.32 on Preferred

Construction Materials Corp. of Chicago, Ill., and subsidiaries report for the year ended December 31, 1931, net profit of $174,377 after charges and federal taxes, equivalent to $2.32 a share on 75,000 shares of $3.50 cumulative preferred stock.

This compares with a net profit in 1930 of $414,854, equal after allowing for dividend requirements on $3.50 preferred stock, to 82 c. a share on 185,000 no-par shares of common stock.

The balance sheet shows current assets of $2,197,975, as against current liabilities of $968,434. In the assets were cash of $208,224, and accounts and notes receivable of $1,145,738, of which $959,271 consisted of City of Chicago assessment bonds, tax warrants, and open accounts.

## Riverside Cement Pays Dividend on Preferred

The regular quarterly dividend of $1.50 per share on the first preferred stock was declared by the Riverside Cement Co. at its annual meeting held April 14 at Los Angeles. The disbursement was payable May 1 to stockholders of record April 15.

The annual meeting was merely routine, all officers and directors being reëlected for the ensuing year.

## Alpha Portland Loss in 1931 Reported $907,773

Alpha Portland Cement Co. reports for the 12 months ended March 31, 1932, consolidated net loss of $907,773 after taxes, depreciation, minority interest, etc. This compares with net income of $1,198,812 after taxes and charges, equivalent after 7-per cent. preferred dividends, to $1.49 a share on 711,000 no-par shares of common stock in 12 months ended March 31, 1931.

Current assets as of March 31, last, including $5,362,482 cash and marketable securities, amounted to $8,114,573 and current liabilities were $450,967. This compares with cash and marketable securities of $6,521,342, current assets of $9,672,687 and current liabilities of $629,988 on March 31, 1931.

Consolidated income account for the year ended March 31, 1932, compares as follows:

| | 1932 | 1931 |
|---|---|---|
| Net sales | $5,631,354 | $9,580,011 |
| Operating expenses | 5,410,263 | 7,025,224 |
| Depreciation | 1,382,317 | 1,345,253 |
| Operating loss | $1,161,226 | *$1,209,534 |
| Other income (net) | 246,066 | 159,278 |
| Loss | $ 915,160 | *$1,368,812 |
| Federal taxes | ..... | 170,000 |
| Minority interest | 7,387 | ..... |
| Net loss | $ 907,773 | *$1,198,812 |
| Preferred dividends | 140,000 | 140,000 |
| Common dividends | 711,000 | 1,244,250 |
| Deficit | $1,758,773 | $ 185,438 |

* Profit.

Surplus account follows: Surplus April 1, 1931, $3,240,274; deduct: deficit of subsidiary not heretofore consolidated, applicable to minority interest and adjustment of acquired surplus, $51,668; net loss for 12 months ended March 31, 1932, $907,773; balance, $2,280,833; add: reduction of stated value of common capital stock, $5,648,500; unused portion of provision for additional federal taxes prior years, $12,158; total, $7,941,491; deduct: preferred dividends, $140,000; common dividends, $711,000; write-down of U. S. government and municipal securities to market value as of December 31, 1931, $426,338; surplus March 31, 1932, $6,664,153.

## Johns-Manville Shows Loss in First Quarter

Johns-Manville Corp. and subsidiaries, producers of asbestos products, report for the quarter ended March 31, 1932, net loss of $912,607 after depreciation, depletion and federal taxes.

This compares with net profit of $230,109, equivalent after dividend requirements on 7-per cent. preferred stock, to 13 c. a share on 750,000 no-par shares of common stock in first quarter of 1931.

Consolidated income account for the quarter ended March 31, 1932, compares as follows:

| | 1932 | 1931 |
|---|---|---|
| Sales | $4,604,192 | $7,811,486 |
| Costs and expenses | 5,046,994 | 7,080,201 |
| Depreciation & depletion | 469,805 | 482,902 |
| Loss | $ 912,607 | *$248,383 |
| Federal tax | ..... | 18,274 |
| Net loss | $ 912,607 | *$230,109 |

* Profit.

## Texas Gulf Quarter Net Exceeds Dividend Needs

The Texas Gulf Sulphur Co. will report a net profit for the first quarter of slightly over 65 c. a share on its 2,540,000 shares of capital stock, thus covering the quarter's dividend requirements of 50 c. by a good margin. There is no indication yet of probable tonnage requirements of consumers during the second quarter, although, of course, demand from the fertilizer industry will be materially curtailed.

Texas Gulf reported a net of 88 c. a share in the final quarter of 1931, and earned $8,942,602, or $3.52 a share, for the full year.

## Atlas Powder Co. and Peerless-Union Merge

The Peerless-Union Explosives Corp. has merged with the Atlas Powder Co. of Wilmington, Del., and all plants and business are now being handled by the Atlas company. The addition of Peerless-Union to Atlas gives this old established company still greater facilities for serving its nation-wide explosives trade. New Atlas sales offices, as a result of the combination, are located at Tamaqua, Pa., and Charleston, W. Va.

### CURRENT DIVIDENDS

| Company | Class of Stock | Dividend Rate | Holders of Record | Payable |
|---|---|---|---|---|
| Alpha Portland Cement | Preferred | $1.75 qr. | Mar. 1 | Mar. 15 |
| Arundel Corp. | Common | $0.75 qr. | Mar. 23 | Apr. 1 |
| Boston Sand & Gravel | Common | $0.15 qr. | Mar. 22 | Apr. 1 |
| Boston Sand & Gravel | Preferred | $0.87½ qr. | Mar. 22 | Apr. 1 |
| Calaveras Cement | Preferred | $1.75 qr. | Mar. 31 | Apr. 1 |
| Canada Cement | Preferred | $1.62½ qr. | Feb. 29 | Mar. 31 |
| Dufferin Pav. & Crushed Stone | Preferred | $1.75 qr. | Mar. 24 | Apr. 1 |
| Hazle Atlas Glass | Common | $0.25 extra | Mar. 19 | Apr. 1 |
| International Cement | Common | $0.50 qr. | Mar. 11 | Mar. 31 |
| International Salt | Common | $0.50 qr. | Mar. 15 | Apr. 1 |
| Johns-Manville | Preferred | $1.75 qr. | Mar. 11 | Apr. 1 |
| National Gypsum Co | Preferred | $1.75 qr. | Mar. 19 | Apr. 1 |
| Owens-Illinois Glass | Preferred | $1.75 qr. | Mar. 16 | Apr. 1 |
| Pacific Portland Cement | Preferred | $1.62½ qr. | Mar. 31 | Apr. 5 |
| Pennsylvania Glass Sand | Preferred | $1.75 qr. | Mar. 25 | Apr. 1 |
| Pittsburgh Plate Glass | Common | $0.25 qr. | Mar. 10 | Apr. 1 |
| Riverside Portland Cement | Preferred | $1.50 qr. | Apr. 15 | May 1 |
| Superior Portland Cement | Class A | $0.27½M | Mar. 23 | Apr. 1 |
| Texas Gulf Sulphur | Common | $0.50 qr. | Mar. 1 | Mar. 15 |
| U. S. Gypsum Co | Preferred | $1.75 qr. | Mar. 15 | Mar. 31 |
| U. S. Gypsum Co | Common | $0.40 qr. | Mar. 15 | Mar. 31 |
| Wallace Sand, Ltd. | Preferred | $1.50 S.A. | Mar. 31 | Apr. 15 |
| Warner Co. | 1st Pfd. | $1.75 qr. | Mar. 15 | Apr. 1 |
| Worcester Salt | Common | $1.25 qr. | Mar. 24 | Mar. 31 |

# Review of Foreign Practice

## Magnesium Orthosilicate Employed as Refractory

Mixes of magnesium oxide and of silica in the proportion of approximately 57 per cent. MgO and 43 per cent. $SiO_2$—that is, the composition of magnesium orthosilicate, $Mg_2SiO_4$—have a melting point of 1,925 deg. C., and are valuable as refractories. This substance occurs in the native state as the mineral Forsterite, but deposits are so rare that the main commercial supply must be made artificially. It has been proposed to do this by fusing magnesium hydrosilicates, such as serpentine, with magnesia; but this process is difficult because of the high melting points of the constituents. Another process, described in German patent 417,360, calls for mixing magnesium salts such as magnesium sulphate with finely-divided quartz sand, which can be fused at the comparatively low temperatures of 1,000 to 1,500 deg. C. This process, however, has the disadvantage of all fusing processes—the rapid wear of the parts used in the process.

There are large natural occurrences of magnesium hydrosilicates, such as talc and serpentine, but these are usually mixed with impurities such as iron and other metals, making their use difficult. Austrian patent 121,249 describes a process for using these materials, mixed with magnesium oxide or carbonate, not by fusing but by a process of reaction in the solid state borrowed from the ceramic industry. The harmful effects of the iron and other metals is combated by proportioning the mix so that these are converted into magnesium ferrite and the like.

Some magnesium silicates such as olivine expand when heated; others shrink. This gives importance to English patent 340,487, which avoids harmful effects from alteration of volume of the refractories by appropriate mixing of the raw materials.—Dr. F. Reinhart in *Tonindustrie-Zeitung* 56: 323-324, Mar. 17, 1932.

## Spain Forms Commission to Guide Cement Trade

In January of this year the Spanish Minister of Public Works issued a decree forming an Assessing Commission for the Cement Industry for the purposes of: (a) establishing sales prices of cement, with regard to the true costs of production; (b) issuing regulations for the quality and uses of cement; (c) establishing on its own account a research laboratory for cement and concrete; and (d) continuing the statistics on the production and consumption, geographic areas of distribution, haulage costs and similar data concerning the cement industry.

The commission will consist of the sub-secretary of the Ministry of Public Works, two representatives of the state named by the Minister of Public Works, two representatives of the cement manufacturers elected by them, and two representatives of the Spanish Assn. of Contractors and Public Works. It succeeds the former Regulating and Inspecting Body of the Cement Industry. That body, however, had as its main object the regulation of new plant installations and extensions, while the present commission is organized to cope mainly with a more pressing problem of the present times—that of price. The statistical work is simply continued from the old organization, while the research laboratory is a new development. The editor of Cemento regards the move as one of great possible benefit to the industry and to the nation.—*Cemento* (Barcelona) 4:33-34 and 56, Feb., 1932.

## Latvian Cement Output Exceeds Domestic Needs

In 1930 the cement industry of Latvia completed a program of plant modernization begun in 1929, and at present its output not only is sufficient for the needs of the domestic market but also leaves a considerable excess available for export. The large cement plant at Riga has several rotary kilns and can produce 500,000 *tuns* of Portland cement annually. Since last year this plant has also begun the manufacture of plaster and other gypsum products. The raw materials for the manufacture of cement and plaster are of domestic origin.—*Revue des Materiaux de Construction* No. 268, p. 40, Jan., 1932.

## Europeans Contend for Dutch Cement Business

In the years following the war almost all cement-producing countries of Europe sold cement in the Netherlands; besides the products of the great exporting countries of Belgium and Germany, cement from England, Switzerland, Austria and even Poland was sold on the Dutch market. Switzerland and Poland had the advantage of exceedingly low railway freight rates across Germany. The demand for cement was high and prices held up accordingly. After a few years, however, prices began to fall, and increased railroad freight rates in Germany made it particularly hard for the Swiss and Polish producers to sell in Holland at a profit. At that time Holland had no cement plant of its own, but the construction of two Dutch plants—the "Enci" plant at Maastricht and the Hoogovenbedrijven plant at Ijmuiden—diminished the need for import. Under these circumstances the German and Belgian manufacturers made a working agreement to hold up the sinking prices in the Netherlands against all other foreign competition. For a few years the Dutch plants worked with the Belgian and German group. Conditions have again been unsettled by the fall of the pound in England, making it possible for England again to compete in price for the Dutch market.—*Gewapend Beton*, quoted in *Tonindustrie-Zeitung* 56:218-219, Feb. 18, 1932.

## Rate Suspension Sought

(*Continued from page 52*)

ment now effective on lime in Official Territory, as shown by the following comparisons:

| Miles | Rates in Official Territory | | Proposed Within and to Southwestern Territory |
|---|---|---|---|
| | 1 | 2 | 3 |
| 150 | 13 | 13 | 17 |
| 200 | 14 | 14 | 19 |
| 300 | 17 | 16½ | 23 |
| 400 | 18½ | 18 | 27 |
| 500 | 21 | 20 | 30 |
| 600 | 22½ | 21½ | 34 |
| 709 | 24 | 23 | 37 |

1. Lime, 30,000 lb., from Mitchell, Ind., to C. F. A. points in Michigan, Ohio, Pennsylvania and West Virginia, 85 ICC 341.—2. Lime, 30,000 lb., from Carey, Sandusky, and Woodville, Ohio, Groups to C. F. A. territory, 112 ICC 7, and 122 ICC 105.—3. Rates constructed by using 17½ per cent. of first-class Southwestern intraterritorial scale.

It is pointed out that lime is a commodity which is not susceptible to great damage in transit, and its sale price, f.o.b. origins, will average less than $5 per ton in bulk. When shipped in containers, the increased value generally represents the cost of the containers, plus the cost of the labor used in packing. The proposed level of rates appears too high to allow free movement of this commodity from the South to destinations in the Southwest and the proposed level relatively unreasonable when compared with the adjustments voluntarily established by the carriers, and in some instances prescribed by the Interstate Commerce Commission on other commodities moving to, from and within the Southwest.

Amalgamation of the Solid Carbonic Co. and the Dry Ice Corp. of America, two of the pioneer manufacturers and distributors of solidified carbon dioxide, popularly known as "dry ice," has been announced. The combination has manufacturing plants at Niagara Falls, New York, Deepwater Pond, N. J., and Peoria, Ill.

# Manufacturers' Publications

*Each publication listed below contains information of interest to nonmetallic mineral producers. Readers may obtain, without charge—except where a price may be stated—and without obligation, copies of any of these publications by writing directly to the manufacturers who publish them. Please mention* PIT AND QUARRY *when writing.*

**Clarifiers**

*Hardinge Clarifiers.* 12 p. (Bull. No. 38. The Hardinge Co., York, Pa.) Describes and illustrates a line of clarifiers for use in industrial waste treatment, water purification, and sewage treatment.

**Crusher Hammers**

*Briggs Renewable Tip Hammers.* 6 p. (William C. Briggs, Philadelphia, Pa.) Describes and illustrates a hammer for hammer-mills featuring a renewable tip which locks automatically to the hammer base.

**Dredging**

*Hydraulic Dredge of Steel Construction Embodies Distinctive Design Features.* 12 p. (Bull. P-5. American Manganese Steel Co., Chicago Heights, Ill.) Describes and illustrates an up-to-date hydraulic dredge recently installed at one of the sand-and-gravel plants of the Koenig Coal & Supply Co. at Oxford, Mich.

**Electrical Equipment**

*Explosion-proof CR-7006 Switches.* 2 p. (General Electric Co., Schenectady, N. Y.) Describes and illustrates a magnetic-type switch for use in controlling alternating-current motors which are operated in atmospheres where the explosion hazard exists.

**Grinding**

*The new Raymond Roller Mill.* 6 p. (Raymond Bros. Impact Pulverizer Co., Chicago, Ill.) Describes and illustrates a new kiln mill providing a complete plant for drying and pulverizing materials in addition to separating the finished product and conveying it to storage.

**Lubrication**

*Old Lubrication Methods Cost Money.* 8 p. (United American Bosch Corp., Springfield, Mass.) Describes and illustrates a series of forced-feed lubricators for use on a wide variety of machines, including Diesel engines, air compressors, etc.

**Power Transmission**

*Power Drive Equipment.* 40 p. (Cat. No. 29-A. The Hill Clutch Machine & Foundry Co., Cleveland, O.) Contains an interesting description of a patented oil-film bearing produced in all styles of rigid and ball-and-socket mounting. The catalogue also lists shafting, collars, couplings, jaw clutches and other power-transmission accessories.

**Refractories**

*A Startling Achievement.* 4 p. (Laclede-Christy Clay Products Co., St. Louis, Mo.) Announces a new refractory brick known as Laclede Mullite which is said to resist spacing due to temperature changes, and to withstand high temperatures without shrinkage or deformation.

**Testing Machines**

*Southwark-Emery Testing Machines.* 36 p. (Bull. No. 28. Baldwin-Southwark Corp., Philadelphia, Pa.) Describes and illustrates a line of testing machines and apparatus in which a 4,000,000-lb. machine recently installed at the University of California and similar equipment in service at the U. S. Bureau of Reclamation at Denver, Colo., are featured.

**Tractors**

*Hercules Crawl-Tractor Flexibility.* 4 p. (The Hercules Co., Marion, O.) Describes and illustrates the broad application of a crawler tractor and its ability to operate in apparently inaccessible locations.

**Trucks**

*On Jobs Like These.* 32 p. (International Harvester Co., Chicago, Ill.) A book of pictures and brief text illustrating the wide application of heavy-duty and high-speed trucks in materials handling.

**Wire Rope**

*Why Is Flex-Set Preformed Wire Rope Like a Carefully Broken-In Automobile?* 4 p. (Broderick & Bascom Rope Co., St. Louis, Mo.) The bulletin answers the question in its title as follows: "Because the wire and strands are already adjusted to each other." Contains a brief explanation of the preformed wire rope made by this concern.

## Air Equipment Used in Erection of Hoover Dam

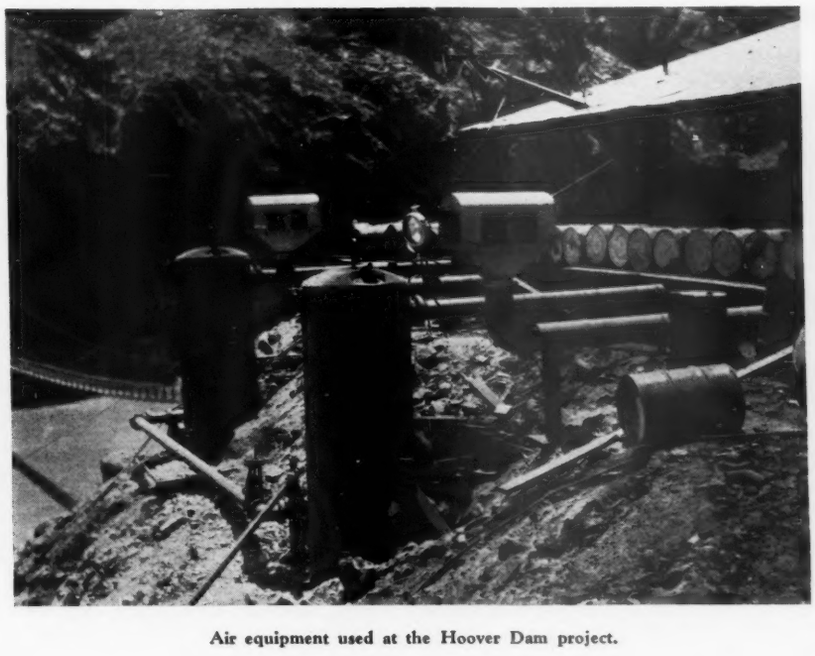
Air tools and the requisite compressed-air power plant are playing a large part in the construction of the Hoover Dam. In fact, they have been practically the first pieces of construction equipment to go on the job.

It is interesting to note that tools and compressors have been prepared for long life (the job is scheduled to take about 6½ years) by being equipped with efficient air filters of unique design. These have been installed on compressor intakes and are of a type particularly suited to use on construction jobs. One of these filters is shown just to the right of each of the two air receivers, in the accompanying picture.

The filters are of the dry type made up in multiples of 100 c.f.m. capacity, using units consisting of special wool-felt elements supported on rust-proof, welded-wire spacer frames. Units are mounted on a base fitted with a pipe flange for connection to the compressor intake. Elements are enclosed by rustproof-metal, louvered-housing covers, making them suitable for outdoor erection without additional protection.

It is claimed that these filters are 100 per cent. efficient and give a drop in pressure of only 3/16-in. water pressure. They require no accessory equipment for periodic cleaning and regeneration. They can be cleaned in place by blowing off with an air hose and without taking out of service, making them especially adaptable to use on construction jobs.

Annis air filters, manufactured by Coppus Engineering Corp. of Worcester, Mass., are the filters mentioned.



Air equipment used at the Hoover Dam project.

# New Machinery and Supplies

## New Drifting Drill Has Numerous Improvements

The Gardner-Denver Co., Quincy, Ill., announces a new light-weight, all-purpose drifting drill, suitable for mines and quarries. Several improvements have been incorporated in it from the standpoint of drilling speed, efficiency, lack of vibration and reliability.

The backhead has dual connections, allowing the air connection to be placed at either the side or the rear of the machine as desired and allowing the water to be admitted on either the back or the side.

An integral lubricator supplies lubricant to all parts of the machine. A chamber surrounding the cylinder liner is used as a reservoir from which the lubricant is fed to the rear end of the chamber.

The front cylinder bushing has been eliminated and a bronze liner supporting the front end of the hammer is pressed into the cylinder. The bronze liner is renewable.

Specifications give the over-all length of drill as 28 in. and weight, mounted, 142 lb.

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## Special Crawlers Used on New Model Drag-Line

The new "45" drag-line recently introduced by Bucyrus-Erie is a special machine for drag-line work. One of its outstanding features is the long, tapered, crawler-type mounting which enables it to work on, and cross, soft ground easily and without nosing in. These crawlers are 19 ft., 6 in. long and in design follow closely the type used on the Class 9½ drag-line which is noted among old timers in the drag-line business for having one of the most successful drag-line mountings ever built. The new mounting gives lowest ground pressures, has high clearance under the frame, and propels easily even in heavy, sticky mud.

The 45-B may be equipped with a 2 to 2¼-cu.yd. bucket (depending on the weight of the bucket, the material being handled, and the working radius) and 50-ft. boom, or a 1¼ to 1½-cu-yd. bucket on a 65-ft. boom. Booms may be had up to 80 ft. long. It is equipped with a 155-hp., 6-cylinder engine and ratings show unusually high speed and line pulls. The boom is of strong but light-weight design and is built of alloy steel. The machine steers like a tractor, through clutches controlled by a lever at the operator's side; it makes sharp or gradual turns with the cab in any position.

This new dragline-line has large fairlead sheaves that cut down rope wear. It is not convertible to a shovel though it may readily be used for clam-shell or crane service. It is only necessary to remove boom and A-frame to ship on most U. S. railroads.

Readers may obtain further information by writing to Bucyrus-Erie Co., South Milwaukee, Wis.

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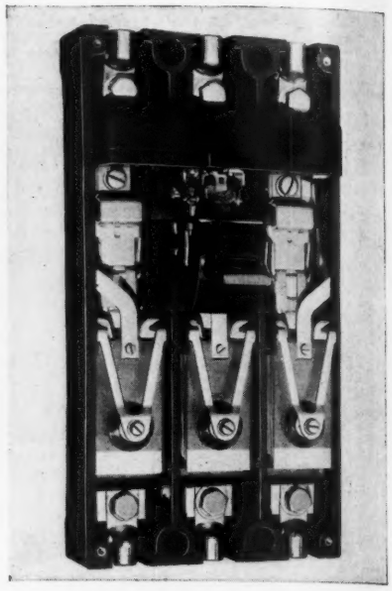
## Breaker an Innovation in Circuit Protection

For circuit protection wherever electricity is used, a safe, flashless device has been developed to perform the function heretofore left to carbon circuit breakers or fuses. It is known as the AB "De-ion" circuit breaker and is a development of the Westinghouse Electric & Manufacturing Co.

A number of advantages over fuses and carbon circuit breakers are claimed for these "De-ion" breakers. Unlike a fuse, the "De-ion" breaker has nothing to be replaced or renewed; it can be reclosed by anyone as quickly and easily as a switch. It can not be held closed against an abnormal overload or short circuit, nor can it be blocked to prevent opening the circuit; its rating can not be changed by unauthorized persons. It has a time lag preventing unnecessary tripping on slight, momentary overloads.



A 3-pole, 225-amp. breaker with the cover removed.

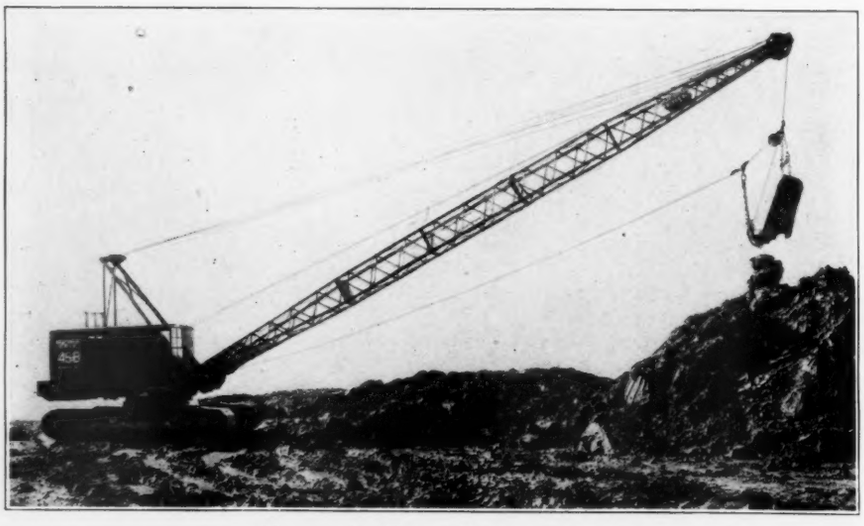
The "De-ion" breaker requires only about 70 per cent as much mounting space as a carbon breaker. Unlike the latter, it opens a short circuit without flash or undue noise.

The "De-ion" breaker is so enclosed in a molded composition box that no live parts are exposed. A handle, like that of a switch, protrudes through the cover to provide means for manual operation and for reclosing the breaker after it has been tripped, but the remainder of the mechanism is entirely enclosed.

The operating mechanism is arranged to provide quick make and quick break. The contacts, which are trip free of the handle, are held in the closed position by a toggle composed of two sets of links, one of which is fulcrumed to the contact mechanism, and the other on a cradle beam pivoted on the frame at one end and latched to the trip mechanism on the other end. The trip mechanism consists of a bi-metal thermal unit calibrated to trip at 125 per cent. overload. On breakers of 50 amp. or more an additional trip of the magnetic type trips the breaker instantly on short circuits.

Upon being released by the trip mechanism, the cradle beam moves, permitting the toggle linkage to break and the contacts to open at high speed.

When the contacts open the arc is drawn through a series of small parallel plates 1/16 in. apart. Between the plates a radial magnetic field is created by a nearby coil. The arc cre-



The new drag-line machine in operation.

ates another magnetic field which moves the arc into the radial field. The plates absorb so many free ions that the arc is destroyed.

In factories and buildings, the "De-ion" circuit breaker replaces fused knife switches, safety switches, and carbon breakers, for motor circuits and general light and power distribution. As a replacement for safety switches it is mounted in a steel enclosure. The case and the operating handle covers are hinged, and can be locked to prevent operation by unauthorized persons. A small red indicating neon lamp shows when the breaker is closed.

The use of "De-ion" breakers reduces the size of switchboards. A 600-amp. "De-ion" breaker occupies a space 8¼ in. wide, while a 600-amp. carbon breaker requires a space 22 in. wide.

The 15 to 50-amp. breakers will be available in 1, 2, and 3-pole combinations, 125 and 250 volts. The 55 to 600-amp. breakers will be available in 2 and 3 pole combinations up to 575 volts.

The new breakers will be inspected and labelled by Underwriters' Laboratories.

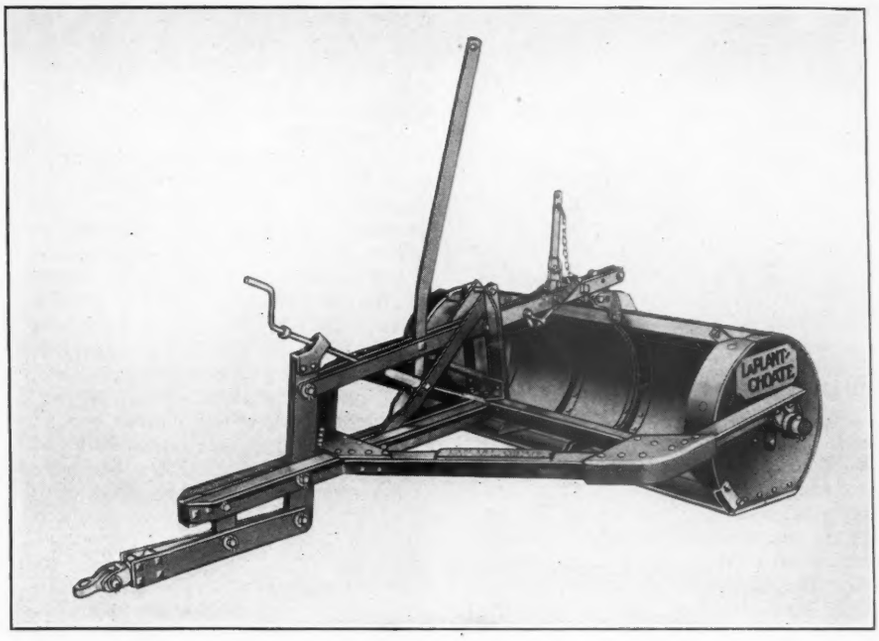
## Scraper Runners May Be Reversed if Badly Worn

Stripping operations can often be performed in an exceedingly economical manner by the scraper method. The LaPlant-Choate Co. of Cedar Rapids, Ia., recently acquired the license to manufacture automatic roll-over scrapers under the Reynolds patents. These scrapers, built in five sizes, are now being manufactured by LaPlant-Choate.

The equipment is featured by the fact that the runners, of heat-treated, carbon-manganese steel, are so drilled that they can be reversed if excessive wear should occur. A crucible steel cutting edge runs the full length of the bowl. Two cutting edges are provided on every scraper, the rear bottom plate being beveled on one edge and interchangeable with the cutting edge, when wear occurs. The cutting edge and bottom plates are bolted with countersunk, hexagon head bolts, to facilitate quick and easy changing or replacement when necessary. Small cutting bits are provided at each side of the bowl for cutting through the top soil and preventing wear on the bowl edge.

The main frame of the scraper is made of heavy angle steel, which is reinforced at the corners with angle corner ties, electric welded to form a box construction to prevent chattering and breakage. Both the scraper frame and tongue are reinforced and trussed to withstand side strains as well as extreme, direct pull.

The scrapers are equipped with an automatic pressure release which lifts the cutting edge out of the ground when the scraper is loaded. This pressure can be adjusted to meet varying soil conditions. An additional lever with a pull rope running to the tractor permits the operator to vary this pressure at will. This feature is particularly advantageous when working in rocky or sandy soils where there is a marked tendency for scrapers to pull out of the ground and is also used to shave off the high spots and miss the low ones.




The automatic roll-over scraper.

The load can be dumped in one pile or spread in a layer. An adjustment is provided on the back of the bowl to regulate the spread to any desired depth. After the load is dumped, the bowl automatically catches so that it rides, when empty, on the two steel runners. The clearance below the frame and between the frame and the scraper bowl permits loading without obstruction.

## Improved Bearings Add to Efficiency of Scale

The Kron Co. of Bridgeport, Conn., formerly the American Kron Scale Co., has just improved its line of industrial scales.

The new dial is rich in appearance, sensitive in action and extremely durable in construction. Over 48 bearing points have been eliminated in the dial mechanism—the 6 remaining bearing points being of specially designed anti-friction type. These pivot points are ball bearings. The bearings are made of high-carbon chrome-steel with accuracies in tolerance to within less than one ten-thousandth of an inch. Each bearing is tested for extra free operation so that friction at the pivot points is practically eliminated. This insures a compact, rigid construction, capable of high overloads and eliminates wear at pivot points.

Bearings are sealed in a dust-proof housing where no attention is required.

Due to unique engineering, the sector has been so constructed as to offset absolutely all vibration that may be present in the building in which the scale is located. The pointer points and remains steady at the proper weight. This allows quicker and more accurate reading of the weight.

Further, there is but one point for adjusting the Kron scale, which allows this work to be done quickly and accurately should it ever be necessary to have the scale readjusted. This permits one to locate and seal every graduation between zero and capacity limits.

The face of the scale is bordered by a chromium-plated ring on both outer and inner circles.

Those interested in scientific automatic weighing will find much of interest in the booklet "Scale-ology," a free copy of which will be mailed to anyone writing The Kron Co.

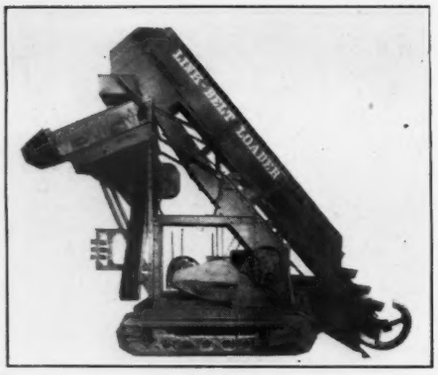
## Mechanically-Vibrated Screen Used on Loader

Maintaining a policy of continual research and improvement of its complete line of portable loading equipment, Link-Belt Co., Philadelphia, Pa., announces the 1932 model Link-Belt vibrating-screen loader for sand and gravel, crushed stones, etc.

Among the improvements that have been made is the use of a mechanically-vibrated screen of the Link-Belt positively-driven type, the amplitude of vibration, or throw of the screening surface, being set at the factory, before loader is shipped, to vibrate the material gently, yet intensively and positively, over the entire screening area, and screen it clean.

The new screening arrangement provides greater clearance under the chute to truck. This is a feature that will make the new loader more widely adaptable.

With the positive-drive screen, the inclination of the screening surface can easily be varied on the job, between 18 deg. and 25 deg., to suit the




Loader equipped with vibrating screen.

work. Cantilever leaf springs maintain the screen box at a constant angle, being adapted for the circular motion produced by the action of the eccentric, positive-drive. The screen bearings are of the self-aligning spherical roller bearing type.

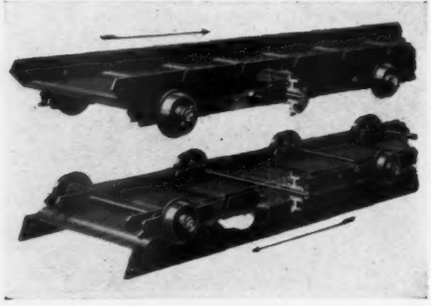
The entire loader is under the complete control of the operator on a large, roomy platform, all operating levers being within easy reach. The bucket elevator capacity is 1¾ cu. yd. per min., with uniform feed, the foot of the loader being equipped with an improved helical steel ribbon feeder, which clears a path 7 ft. 7 in. wide, delivering the material to the buckets gently and uniformly.

A three-speed transmission gives the crawlers a speed of 30 ft. a min., or 66 ft. per min., in the digging direction, and 27 ft. per min. in reverse. The driving machinery runs in oil and is enclosed in a dust-tight housing.

Further particulars may be had by addressing Link-Belt Co., 2045 W. Hunting Park Ave., Philadelphia, where these machines are made.

## Gravity Seal Features Steel Apron Conveyor

For long-time operation under exceptionally severe operating conditions, the Gravity-Seal steel apron conveyor has been perfected by the Webster & Weller Manufacturing Companies, Chicago. The "gravity-seal" feature is based upon a new method of attaching the conveyor pans to the chains by means of a patented pivot link. It is the operation of this link, in connection with several minor constructional features, that causes the pans to overlap so snugly as to eliminate the possibility of leakage of material and yet provides sufficient flexibility to enable the conveyor to travel evenly and without strain around the sprockets.



Two views of the apron conveyor.

The cross rods, mounted through the center of the chain links, are fitted with hardened bushings of unusual length. All roller parts may be quickly and easily replaced without unduly interfering with the operation of the conveyor. Each pair of rollers carries the load of two full pan pitches on both the carrying and return run of the conveyor and rollers are idle only while apron passes over sprockets.

"Gravity-seal" construction is applicable to both apron conveyors and apron feeders and has been developed primarily to withstand the abrasive action of material being handled.

## Shank Grinder Assures True Drill-Steel Ends

Ingersoll-Rand Co., New York, announces the 4K shank grinder, a tool for facing the striking ends of drill-steel shanks, rock drill, paving-breaker pistons, and anvil blocks.

The machine consists of a multi-vane air grinder mounted in a frame so as to allow the grinding wheel to be passed back and forth by means of a handle. The grinder mounting is fitted with a wing-nut adjustment working under spring tension for feeding the wheel up against the face being ground.

The steel or piston is held in a self-centering V-block clamp incorporated in the frame. A counter-sinking bit is located in the center of the grinding wheel for removing the burr from the hole in hollow drill steel. The complete machine can be bolted securely to the top of a work bench or other suitable location.

The 4K grinder insures the uniform and correct dressing of striking faces and eliminates rounded drill steel shank ends and cupped pistons, which are responsible for much of the spalling and breaking of these parts. Its use results in better performance of drills and paving breakers and reduces maintenance and replacement costs.

## A Correction

An item in this department in the April 6, 1932, issue on the flexibility of small shovel equipment, in connection with the introduction of a new ⅜ cu.yd. machine, was credited to C. E. Kohl, engineer of the Austin Machinery Co. Mr. Kohl is affiliated with the Austin Manufacturing Co., manufacturing division of the Austin Western Road Machinery Co., the company which is responsible for the design and manufacture of the new shovel.

The Materials Handling Institute will meet May 5 at Detroit, Mich., in connection with what is known as the Three M Congress, covering management, maintenance and materials-handling.

## New Books

PRICING FOR PROFIT. *By W. L. Churchill. 271 pp. The Macmillan Co., New York, N. Y. Price $3.00.*

Liberal and continuous profits for business and industry are not only desirable but necessary to the general economic welfare. How to make business profitable—to stockholders, management, employees, and thus to its customers—is to be found in certain economic laws which Mr. Churchill has derived from 15 years of research and practice as business consultant to ailing industries.

These laws and their applications are fully explained in this book. They cover the entire range of management, costs, price policies, advertising and selling, and profit requirements.

From his wide experience with many and various industries, Mr. Churchill shows how these laws govern profits, how their application assures dividends to stockholders and proper returns to both management and labor, and how their violation inevitably brings trouble in spite of efficiency as measured by the usual business standards. Every business man should know these laws and apply them.

Mr. Churchill is a member of the American Society of Mechanical Engineers, an economist and business counsellor of widely recognized ability. For many years his talks on pricing policies have been in demand by manufacturers' groups and trade associations in all sections of the country, and his articles on the subject have had wide circulation.

GEOPHYSICAL PROSPECTING WITH EXPLOSIVES AND THE SEISMOGRAPH. *Published for free distribution by the Atlas Powder Co., Wilmington, Del. 40 pp.*

While not a text-book on seismology, this booklet contains a general description of seismographic methods in order to give those not acquainted with these methods a better understanding of the problems to be considered in the selection of explosives and blasting supplies for this work. Geophysical prospecting, application of seismic methods, explosives as applied to geophysical prospecting, methods of planting the charge, and general blasting methods are included.

## Medusa Subsidiary Will Handle Paint Products

The Medusa Products Co., of Cleveland, O., has been organized as a subsidiary of the Medusa Portland Cement Co., and will function as the selling company for Medusa Portland-cement paint, Medusa floor coating and primer, as well as the entire line of rust-proof coatings and technical paints manufactured by the Studebaker Chemical Co., Elyria, O., for which it will be exclusive distributors.

# Saving Through Safety

## *The Value of the Plant Magazine**

By ALBERT R. COUCHMAN

*Safety Director, North American Cement Corp., Hagerstown, Md.*

THE plant magazine, or house organ as it is commonly called, has an unlimited organization value. It provides the safety engineer with a kit of diversified tools which, if properly applied, will greatly facilitate the difficult problem of maintaining interest in safety, as well as organization interest. I repeat organization interest because no undertaking, within the boundaries of industry, whether it be safety or otherwise, can be successfully carried on without the wholehearted support and confidence of the mass of workmen within the organization. Therefore, the composition of the plant magazine may be paralleled with the work of the safety engineer.

Everyone who is working in the safety field has recognized the task of reducing accidents as an educational one. While there are various methods of applying this education through direct contact with plant activities, on the other hand, however, the dissemination of literature designed to interest both employer and employee is an important factor.

The plant magazine should be designed for such a purpose. It should be a medium through which the safety engineer can instill the ideals of safety into the minds of the workmen. If this is to be accomplished, it is necessary for the safety engineer to have a profound knowledge of the fundamentals of applying psychology to effect, through his magazine, the safety habit. There are many ways in which this knowledge may be applied to make men think and act safely. It should be borne in mind that organizations are composed of various types of individuals; material that interests one group may not interest another. In our organization I make periodical checks of the reaction to my material. If I find that I have hit the wrong key, I immediately take steps to correct the situation.

It has been my experience that much good can be accomplished by becoming personally acquainted with the entire organization. Aside from gaining a knowledge of the characteristics and habits of an individual, it gives one a clearer conception of the kind of material that appeals to a certain group or groups of men.

Illustrated sketches, poems and personal items blended with wit and humor appeal to a cross-section of the mass of readers, but real interest is shown if some form of competitive material is published that refers to the interdepartmental or interplant activities.

The safety engineer's pathway is not always strewn with roses; invariably new ideas, new procedures and methods, relating to safety, are bitter pills for some plant men to swallow. I have found, however, that the plant magazine has been the key to unlocking the minds of workmen and plant executives to some of these ideas which otherwise might have been a total failure. When I hit upon a new idea, or have the good fortune to borrow one, I always depend upon the plant magazine to "put it across." If one department or plant accepts it, then I try to create an agreeable public sentiment by giving it magazine publicity which creates a desire among other departments and plants to fall in line for their share of recognition.

If the scope of the plant magazine is broadened to include the safety news of the entire organization, its value is materially increased, for it can be used to stimulate a spirit of friendly rivalry. The workmen in the quarry, the repairman in the mill, the salesman on the road and the executive, all meet on a level as contributors to its pages.

The same spirit of rivalry, if properly encouraged and directed, may provide the spark to ignite the fire of enthusiasm which is such an essential constituent of every successful safety movement. Through its medium of advertising it may be employed to rekindle this enthusiasm at the first indication of lagging interest.

I recall, near the close of 1930, that a personal letter was sent out to all foremen and department heads, asking for their comments on what they were going to do to make the 1931 safety campaign a success. The first replies received were published and within a short period replies came rolling in from all directions. The plant magazine not only offered a challenge but the spirit of rivalry was aroused. Bill Jones decided that Tom Brown was not going to get ahead of him; in this and similar instances the plant magazine has been a valuable asset in maintaining organization interest.

Since the conception of the magazine of which I am editor, I have discovered some real talent. Down in the quarry we find a Shakespeare, in the mill we find a Mark Twain and throughout the plant many Byrons have stepped from the side lines to promote accident prevention through their contributions to the plant magazine.

The plant magazine, with its messages of safety, is a subsequent factor in the promotion of public safety as well as safety in the homes. While the National Safety News and other similar magazines have contributed to these important phases of accident prevention, on the other hand, however, their distribution has been limited, thereby leaving a gap between the plant and the home. The plant magazine can be utilized to fill in this gap and, with a proper distribution, it should produce a far-reaching effect. The entire family is given an opportunity to acquaint itself with the plant activities, that same safety habit which is gradually being engraved in the characters of the workmen will eventually have a psychological effect upon both family and community as a whole.

This, however, is only one side of the picture that enables us to visualize the value of the plant magazine. On the other side we find it a medium through which men and management are brought together in a closer relationship. It promotes good-will and helps to obliterate indifference. It leads men to appreciate and view the problems of management with a coöperative attitude; it helps to increase their personal efficiency and strengthens their confidence in the organization with which they are connected; all which assists in building a better *morâle*, which after all is the one essential cog in the wheels of industry.

*Presented at the National Safety Congress.

## Veteran Cement Workmen Given Service Emblems

Service pins were awarded veteran employees of Superior Portland Cement, Inc., at the annual safety rally for employees held in the high-school gymnasium at Concrete, Wash., recently. President E. P. Lucas made the presentations, while Chester N. Reitze, vice-president, made the awards to Concrete high-school students who won the annual safety-essay contest sponsored by the company.

The Concrete plant was one of two Washington winners of the 1931 safety trophy offered by the Portland Cement Assn. for operating the entire year without an accident. The other was the Bellingham, Wash., plant of the Olympic Portland Cement Co.

Effective April 1, all Wisconsin business of the Huron Portland Cement Co., is being handled from its general offices in Detroit. For the convenience of users, however, a district sales office has been opened in Milwaukee. It is located at 4118 Plankinton Arcade.

# Crusher Bowl Rebuilt by Welding in Unusual Reclamation Job

THE fact that metals can be severed as well as joined by the oxy-acetylene process is frequently of importance in reclamation work. Recently at the plant of a Western crushed-stone company, oxy-acetylene cutting with both the blowpipe and the oxygen lance, and bronze-welding were effectively used to give a saving of over $2,000 in the cost of getting a fractured crusher back in operation.

The bowl of a large stone crusher which has been in constant operation had fractured in such a way that it locked in place. The plant officials called in an oxy-acetylene service operator for his opinion as to the possibility of welding the 8½-ft. diameter, 8-ton cast-steel crusher bowl. An inspection showed that in order to remove the fractured bowl it would have to be cut up into pieces. As another fractured bowl of the same size lay in the scrap heap, the service operator suggested that it would be more practical to reclaim the scrapped bowl than to repair the one that had just broken, particularly as all the cracks in the scrapped bowl extended to openings. Accordingly, his recommendation was that the locked bowl be removed by oxy-acetylene cutting and replaced by the scrapped bowl after reclamation by bronze-welding.

The bowl varied from 3 in. to 7 in. in thickness. There were four cracks each 26 in. long on the inner section, and on the bottom 11 cracks from 8 in. to 18 in. each in length. All the cracks were veed out to an included angle of 90 deg. by means of the cutting blowpipe, and the beveled surfaces were chipped to remove any oxide or slag that remained from the cutting. Chipping was extended back about ¾ in. from each edge of the vee so as to provide a suitable surface for the tinning action in reinforcing the bronze-welds.

A wood fire was then built around the casting in order to remove the chill. During the bronze-welding, a preheating torch flame was played constantly on the opposite side from which the welders were working. All the cracks in the bottom section were welded first. These extended through the heaviest sections of the casting, which were 7 in. thick. By following this procedure, the long breaks extending up through the center section of the bowl to the openings above were done last, thus assuring the elimination of contraction strains which might have set up if the opened cracks had been done first.

The breaks in the center section of the bowl were welded in a vertical position, and in order to facilitate the deposition of bronze, a ½-in. by 1-in. piece of strap iron long enough to reach beyond each edge of the fracture was used to back up the weld. On the outside, or vee side, a dam was made up progressively as the weld metal was deposited. This was made up of ½-in. concrete-reinforcing steel bars cut in sections long enough to extend beyond the edges of the vee. Each end of each bar was bent about 10 deg. so that the dam permitted sufficient reinforcement of the weld. As the welding progressed, a helper placed additional bars on top of each other, thus building up the dam and also permitting the welder to use a larger flame because he did not have to devote special attention to supporting the molten metal across the face of the vee. The strap and bars were left in place when the welding was completed, except in those sections where the surface of the weld had to be flush with the casting surface.

When all the welding was completed the casting was heated up evenly with a wood fire and then permitted to cool slowly. A total of about 58 welding hours was required for this work, and about 285 lb. of high strength bronze-welding rod was used.

While supervising the welding of the bowl, the service operator also supervised the cutting and removal of the more recently broken bowl which had locked itself in place. As there was a ¾-in. layer of zinc between the liner and the bowl, it was found difficult to get a good cut all the way through with the blowpipe alone. However, by stabbing several holes through the heavier sections with the oxygen lance, the cutting of the steel and melting of the zinc were considerably facilitated. While cutting, the operators were careful to avoid, as far as possible, inhaling the zinc oxide fumes, and as an additional precaution against possible nausea from the fumes, they drank plenty of milk while this work was being done.

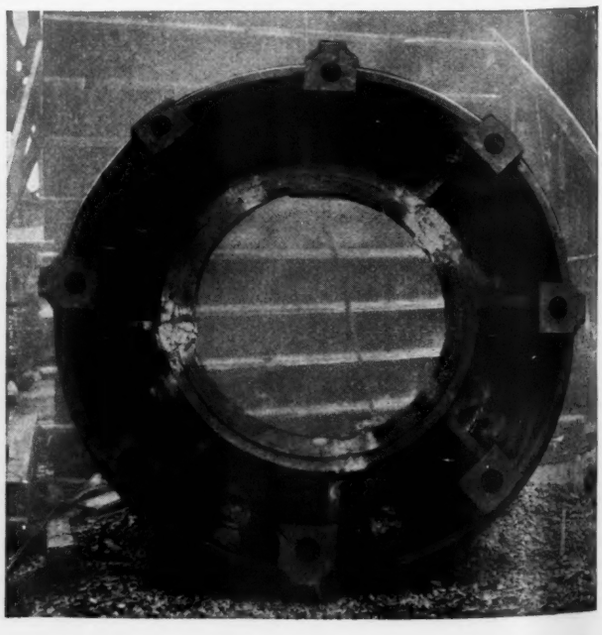
The total cost of reclaiming the old crusher bowl and removing the one that had been destroyed represented a saving of over $2,000 as compared with the cost of a new crusher bowl. In addition the plant welders received valuable instruction in the proper methods for the repair of heavy castings, so that they are better qualified to effect further savings in the maintenance of plant equipment.

## Merger of Meter, Valve Companies Is Announced

Announcement is made of the consolidation of two well-known industrial firms in the merger of the Pittsburgh Equitable Meter Co. with the Merco Nordstrom Valve Co. Arrangements have been completed for the Pittsburgh company to acquire all the capital stock of Merco Nordstrom Valve Co. and the latter will operate as a division of Pittsburgh Equitable Meter Co.

*Below* — Starting to bronze-weld the fractured crusher bowl.

*Right* — The 8-ton rock-crusher bowl successfully reclaimed.



# Eighteen tons per hour from a No. 19 Crusher—100% through three-eighth inch opening using less than fifteen horsepower

THE following is the result of a test on a No. 19 Kennedy Ball Bearing Gearless Crusher.

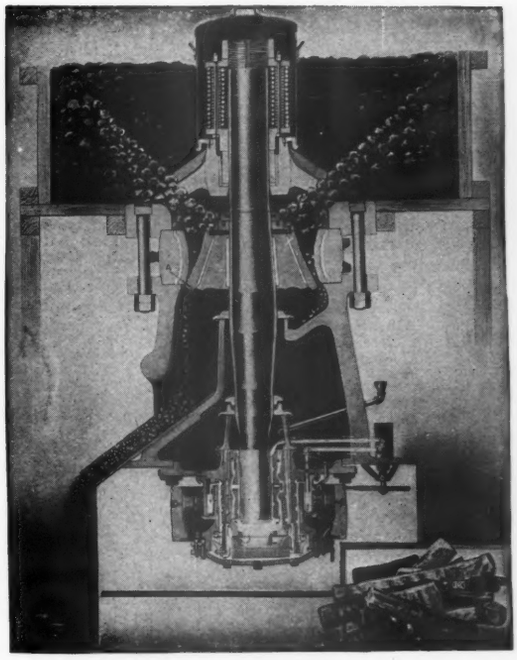
Exceedingly hard glacial gravel, 1½" and plus ⅝", was crushed for sand for concrete purposes, and less than fifteen horsepower was used.

The same crusher can be opened up and 1½" stone can be produced at a rate of from 30 to 50 tons per hour.

With the opening set to ⅛" on the closed side the following results were obtained:

| | |
|---|---|
| Minus ⅜" | 100 % |
| Plus 3 mesh | 21½% |
| Minus 3—Plus 4 | 17 % |
| Minus 4—Plus 14 | 36½% |
| Minus 14—Plus 48 | 15 % |
| Minus 48—Plus 100 | 4 % |
| Minus 100 | 5½% |

*This was crushed at the rate of 18 tons per hour.*



*Built in various sizes with receiving openings from 1¾" to 14". Produces sizes from ⅛" to 3", with capacities up to 620 tons per hour on the larger sizes.*

The Kennedy Ball Bearing Gearless Gyratory Crusher is guaranteed to do more crushing, size for size, of any given material, with less power consumption, than any crusher ever built. 90% Of the power input to motor is applied direct to breaking the rock between head and concaves. The head and shaft of the type "S" crusher is suspended on springs to permit tramp steel to pass through. The ball-and-socket eccentric is self-aligning. This crusher may be operated by a synchronous motor, built in the pulley of the crusher, or by belt from standard motor. This crusher takes one-half the power required for a geared crusher, and saves 80% in the cost of maintenance.

We manufacture a complete line of primary jaw and gyratory crushers, ball mills, rod mills, screening, elevating, and conveying equipment, etc. Complete information describing any or all of this machinery will be sent on request. *Send for latest information on our vibrating screen.*

## KENNEDY-VAN SAUN MFG. and ENG. CORP.

Two Park Avenue — New York, N. Y.

BRANCH OFFICES:—Chicago: 120 South La Salle St. Birmingham, Ala.; Comer Building. Los Angeles, Calif.; 414 South Spring St. London, England: Bush House Paris, France: 40 Rue des Mathurins. Johannesburg, S. Africa: 73 Cullinan Bldg. Canadian Agents, Canadian Fairbanks-Morse Co., 980 St. Antoine St., Montreal, Que Walkers Limited, Maryborough, Queensland, Australia. Cuban Agents, Gerard Janssen Y Cia, Compostela 43, Havana, Cuba.

THE CRUSHER WITH THE TROUBLES LEFT OUT

# Classified Buyer's Guide

## A Directory of PIT AND QUARRY Advertisers Arranged According to Product

*Although every effort is made to insure accuracy and completeness in these listings, the publisher cannot accept responsibility for errors or omissions. Any mistakes discovered will gladly be rectified, if brought to the attention of the Advertisers' Service Department.*

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**Agitators, Thickeners and Slurry Mixers**
Hardinge Co.
Traylor Eng. & Mfg. Co.

**Air Compressors**
Traylor Eng. & Mfg. Co.

**Air Separators**
Gay, Rubert M.
Hardinge Co.
Raymond Bros. Impact Pulv. Co.
Universal Road Machinery Co.

**Ash- and Refuse-Handling Equipment**
Allen-Sherman-Hoff Co.
Haiss Mfg. Co., Geo.
Link-Belt Co.

**Asphalt**
Standard Oil Co. (Indiana)

**Asphalt, Cold Mix, Plants**
Simplicity System Co.

**Automatic Feeders**
Hardinge Co.
Link-Belt Co.

**Automatic Weighers**
Merrick Scale Mfg. Co.

**Babbitt Metal**
Ryerson and Son, Inc., Joseph T.

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Hardinge Co.
Kennedy-Van Saun Mfg. and Eng. Corp.
Rogers Iron Works Co.

**Balls (Tube-Mill, etc.)**
Allis-Chalmers Mfg. Co.
Hardinge Co.
Kennedy-Van Saun Mfg. and Eng. Corp.

**Bearings (Anti-Friction)**
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Rogers Iron Works Co.
Sprout-Waldron and Co.

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**Belt Drives**
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**Belting**
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Haiss Mfg. Co., Geo.
Link-Belt Co.
Sprout-Waldron and Co.
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Welch Eng. Service, F. M.

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**Bins (Cast Iron)**
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**Bins (Steel)**
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Sprout-Waldron and Co.

**Bin Gates**
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Allis-Chalmers Mfg. Co.
Haiss Mfg. Co., Inc., George
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Smith Engineering Works
Sprout-Waldron and Co.
Traylor Eng. & Mfg. Co.

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Ensign-Bickford Co.
Hercules Powder Co.

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**Bodies (Motor Truck, Concrete Mixing)**
Jaeger Machine Co.

**Borings, Core**
Pennsylvania Drilling Co.
Sprague and Henwood, Inc.

**Brake Shoes**
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**Bronze Work (Ornamental)**
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**Bucket Elevators** (See Conveyors and Elevators)

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**Buckets (Dragline Cableway)**
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**Buckets (Elevator and Conveyor)**
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Link-Belt Co.
McLanahan and Stone Corp.
Smith Engineering Works
Sprout-Waldron and Co.

**Cableways**
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Roebling's Sons Co., John A.

**Capstans** (See Winches and Capstans)

**Car Dumpers**
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**Car Pullers**
Link-Belt Co.

**Car Wheels** (See Wheels—Car)

**Carriers**
Link-Belt Co.
Smith Engineering Works
Sprout-Waldron and Co.
Welch Eng. Service, F. M.

**Castings**
Hardinge Co.
Kennedy-Van Saun Mfg. and Eng. Corp.
Link-Belt Co.
McLanahan and Stone Corp.
Norbom Engineering Co.
Rogers Iron Works Co.
Sprout-Waldron and Co.
Weatherly Foundry and Mfg. Co.

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**Central Mixing Plants**
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**Chain (Elevating and Conveying)**
Haiss Mfg. Co., Geo.
Link-Belt Co.
Norbom Engineering Co.
Sprout-Waldron and Co.

**Chain Drives**
Link-Belt Co.

**Chutes and Chute Liners**
Goodyear Tire and Rubber Co., Inc.
Haiss Mfg. Co., Geo.
McLanahan and Stone Corp.
Rogers Iron Works Co.
Sprout-Waldron and Co.
Weatherly Foundry and Mfg. Co.

**Clamshell Buckets** (See Buckets — Clamshell, Orange-Peel, etc.)

**Clamshell Gates** (See Gates-Clamshell)

**Classifiers**
Allen Cone and Machy. Corp.
Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Foundry & Machine Co.
Link-Belt Co.

**Clips (Wire Rope)**
Leschen and Sons Rope Co., A.
Roebling's Sons Co., John A.

**Clutches**
Link-Belt Co.
Sprout-Waldron and Co.

**Coal-Pulverizing Equipment**
Allis-Chalmers Mfg. Co.
Gay, Rubert M.
Hardinge Co.
Kennedy-Van Saun Mfg. and Eng. Corp.
Raymond Bros. Impact Pulv. Co.
Universal Road Machinery Co.

**Compressors** (See Air Compressors)

**Concentrators (Slurry)**
Deister Concentrator Co.

**Cones (Sand-Washing)**
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Link-Belt Co.
Smith Engineering Works

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**Conveyors (Ready Mixed Concrete)**
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**Conveyors and Elevators**
Allen-Sherman-Hoff Co.
Allis-Chalmers Mfg. Co.
Haiss Mfg. Co., George
Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Foundry & Machinery Co.
Link-Belt Co.
McLanahan and Stone Corp.
Rogers Iron Works Co.
Smith Engineering Works
Sprout-Waldron and Co.
Traylor Eng. & Mfg. Co.
Welch Eng. Service, F. M.

**Coolers** (See Kilns and Coolers—Rotary)

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Link-Belt Co.
Sprout-Waldron and Co.

**Cranes (Crawler and Locomotive)**
Link-Belt Co.
Ohio Locomotive Crane Co.

**Crusher Parts**
Kennedy-Van Saun Mfg. and Eng. Corp.
McLanahan and Stone Corp.
Rogers Iron Works Co.
Weatherly Foundry and Mfg. Co.

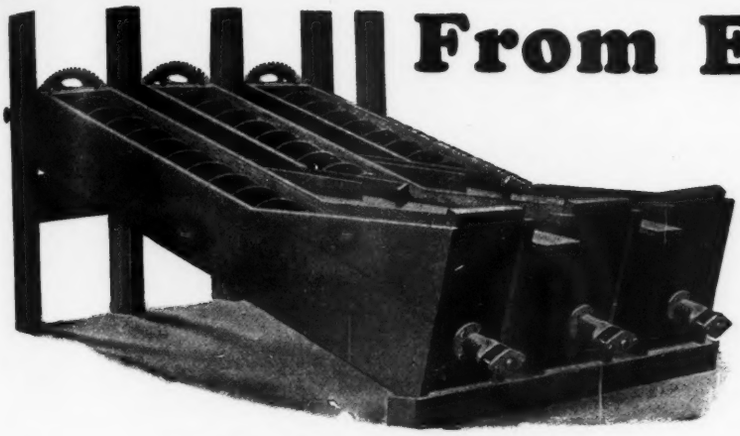
**Crushers (Cone)**
Nordberg Mfg. Co.

**Crushers (Hammer)**
Allis-Chalmers Mfg. Co.
Kennedy-Van Saun Mfg. and Eng. Corp.

**Crushers (Jaw and Gyratory)**
Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Foundry & Machinery Co.
Nordberg Mfg. Co.
Rogers Iron Works Co.
Smith Engineering Works
Traylor Eng. & Mfg. Co.

**Crushers (Roll)**
Allis-Chalmers Mfg. Co.
Kennedy-Van Saun Mfg. and Eng. Corp.
Link-Belt Co.
McLanahan and Stone Corp.
Rogers Iron Works Co.

# From Every Angle



LEWISTOWN SAND WASHER

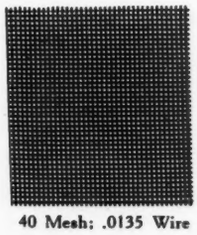
That is how Lewistown Equipment meets the needs of the modern plant. When buying equipment today, the progressive plant operator demands reasonable first cost, low operating cost, and low maintenance costs combined with proved dependable quality.

Lewistown Equipment is designed to give the utmost in service at the lowest possible cost. Lewistown Washers have cleaned up the dirty product problem in many plants. Our Crushers, Grinders, Screens, Washers, Drying and Elevating Equipment, etc., are worth investigating.

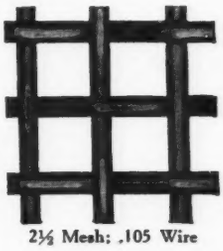
Why not drop us a line, stating what equipment you desire information on.

## LEWISTOWN FOUNDRY & MACHINE COMPANY

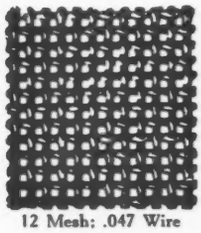
**LEWISTOWN, PA.**



40 Mesh: .0135 Wire



2½ Mesh: .105 Wire



12 Mesh: .047 Wire

# SERVICE!

is the one thought behind every operation in the manufacture of—

## "CLEVELAND"
## Double-Crimped Wire Cloth

Uniform fineness and long service will be assured by its use in screening SAND GRAVEL, CRUSHED STONE AND CEMENT.

Large stock always on hand; special mesh manufactured to suit requirements at right prices.

**THE CLEVELAND WIRE CLOTH & MFG. CO.**

**3579 East 78th Street, Cleveland, Ohio**

# Classified Buyer's Guide

## A Directory of PIT AND QUARRY Advertisers Arranged According to Product

Index to Advertisers on Page 76

**Crushers (Rotary)**
Allis-Chalmers Mfg. Co.

**Crushing Rolls**
Allis-Chalmers Mfg. Co.
Kennedy-Van Saun Mfg. and Eng. Corp.
Link-Belt Co.
McLanahan and Stone Corp.
Rogers Iron Works Co.
Traylor Eng. & Mfg. Co.
Weatherly Foundry and Mfg. Co.

**Diesel Engines (See Engines—Diesel)**

**Dragline Cableway Excavators**
Link-Belt Co.

**Dragline Excavators**
Link-Belt Co.

**Dredge Chain (See Chain)**

**Dredge Pipe (See Pipe)**

**Dredges**
Morris Machine Works
Welch Eng. Service, F. M.

**Drilling Contractors**
Pennsylvania Drilling Co.
Sprague and Henwood, Inc.

**Drills (Blast-Hole)**
Loomis Machine Co.

**Drills, Diamond**
Pennsylvania Drilling Co.
Sprague and Henwood, Inc.

**Drills (Well) (See Drills—Blast-Hole)**

**Drives (Multiple Belt, Chain, Rope)**
Allis-Chalmers Mfg. Co.
Weatherly Foundry and Mfg. Co.

**Dryers**
Allis-Chalmers Mfg. Co.
Hardinge Co.
Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Fdry. & Mach. Co.
McLanahan and Stone Corp.
Traylor Eng. & Mfg. Co.

**Dust-Collecting Systems**
Allen-Sherman-Hoff Co.
Allis-Chalmers Mfg. Co.
Raymond Bros. Impact Pulverizer Co.

**Dust Handling Systems (Hydro Vacuum)**
Allen-Sherman-Hoff Co.

**Dynamite (See Explosives)**

**Electrical Equipment**
Allis-Chalmers Mfg. Co.

**Elevator Belting (See Belting)**

**Elevators (See Conveyors and Elevators)**

**Engineers**
Allen Cone and Machy. Corp.
Allis-Chalmers Mfg. Co.
Kennedy-Van Saun Mfg. and Eng. Corp.
Rogers Iron Works Co.
Sprout-Waldron and Co.
Welch Eng. Service, F. M.

**Engines (Diesel)**
Nordberg Mfg. Co.

**Engines (Internal-Combustion)**
Nordberg Mfg. Co.

**Engines (Steam)**
Morris Machine Works
Nordberg Mfg. Co.

**Excavating Machinery (See Shovels; Cranes; Buckets, etc.)**

**Excavators, Shallow Grading (Bucket Elevator Type)**
Haiss Mfg. Co., Geo.

**Explosives**
Atlas Powder Co.
Hercules Powder Co.

**Fans (Exhaust)**
Kennedy-Van Saun Mfg. and Eng. Corp.

**Feeders**
Allis-Chalmers Mfg. Co.
Hardinge Co.
Kennedy-Van Saun Mfg. and Eng. Corp.
Link-Belt Co.
Smith Engineering Works
Sprout-Waldron and Co.

**Floor Sweeping Systems (Hydro Vacuum)**
Allen-Sherman-Hoff Co.

**Fuses (Detonating)**
Ensign-Bickford Co.
Hercules Powder Co.

**Gaskets**
Goodyear Tire and Rubber Co., Inc.

**Gasoline**
Standard Oil Co. (Indiana)

**Gasoline Engines (See Engines—Internal-Combustion)**

**Gates (Bin) (See Bin Gates)**

**Gates (Clamshell)**
Haiss Mfg. Co., George

**Gears (Herringbone)**
Link-Belt Co.
Sprout-Waldron and Co.

**Gears and Pinions**
Haiss Mfg. Co., Geo.
Link-Belt Co.
Rogers Iron Works Co.
Sprout-Waldron and Co.

**Gelatin (See Explosives)**

**Generators (See Motors and Generators)**

**Glass Sand Equipment**
Lewistown Foundry & Machine Co.

**Grab Buckets (See Buckets—Clamshell, Orange-Peel, etc.)**

**Graphite**
Dixon Crucible Co., Joseph

**Greases**
Dixon Crucible Co., Joseph
Standard Oil Co. (Indiana)

**Grinding Balls**
Hardinge Co.
Kennedy-Van Saun Mfg. and Eng. Corp.
Rogers Iron Works Co.

**Grizzlies**
Allis-Chalmers Mfg. Co.
Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Fdy. & Mach. Co.
Rogers Iron Works Co.
Smith Engineering Works
Traylor Eng. & Mfg. Co.

**Guards (Wire)**
National Wire Cloth Co.

**Hammer Mills (See Crushers—Hammer)**

**Hoists**
Link-Belt Co.
McLanahan and Stone Corp.
Rogers Iron Works Co.
Smith Engineering Works
Sprout-Waldron and Co.

**Hose (Air, Steam and Water)**
Goodyear Tire and Rubber Co., Inc.

**Hose Couplings (See Couplings)**

**Hydraulic Guns (See Guns—Hydraulic)**

**Idlers**
Allis-Chalmers Mfg. Co.
Link-Belt Co.
Smith Engineering Works
Sprout-Waldron and Co.

**Kilns and Coolers (Rotary)**
Allis-Chalmers Mfg. Co.
Hardinge Co.
Kennedy-Van Saun Mfg. and Eng. Corp.
Traylor Eng. & Mfg. Co.

**Kilns (Vertical)**
Hardinge Co.

**Lime-Handling Equipment**
Hardinge Co.
Link-Belt Co.
Raymond Bros. Impact Pulv. Co.

**Lime Kilns**
Hardinge Co.
Kennedy-Van Saun Mfg. and Eng. Corp.

**Lime and Hydrating Plants**
Hardinge Co.

**Linings (Ball- and Tube-Mill) (See Mill Liners and Linings)**

**Loaders and Unloaders**
Haiss Mfg. Co., Geo.
Link-Belt Co.
Sprout-Waldron and Co.

**Lubricants**
Dixon Crucible Co., Joseph
Standard Oil Co. (Indiana)

**Magnetic Clutches (See Clutches, Magnetic)**

**Mill Liners and Linings**
Hardinge Co.
Kennedy-Van Saun Mfg. and Eng. Corp.

**Mills (Grinding) (See also Crushers—Hammer)**
Allen Cone and Machy. Corp.
Allis-Chalmers Mfg. Co.
Hardinge Co.
Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Fdy. & Mach. Co.
Raymond Bros. Impact Pulv. Co.
Rogers Iron Works Co.
Sprout-Waldron and Co.
Traylor Eng. & Mfg. Co.

**Motors and Generators**
Allis-Chalmers Mfg. Co.

**Motors (Internal-Combustion) (See Engines—Internal-Combustion)**

**Nozzles (Hydraulic) (See Guns—Hydraulic)**

**Oils (Graphite)**
Standard Oil Co. (Indiana)

**Oils (Motor)**
Standard Oil Co. (Indiana)

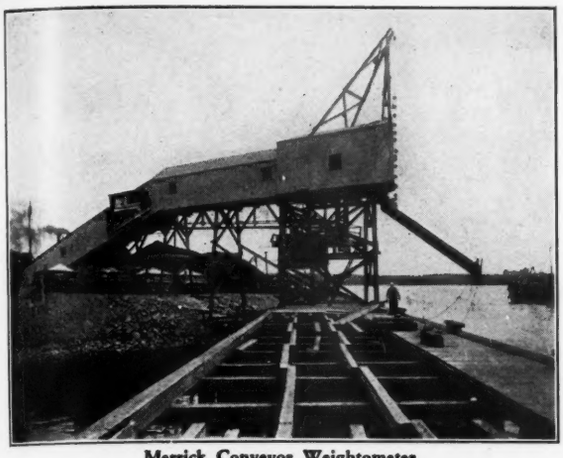
**Ore Separators**
Allen Cone and Machy. Corp.

**Oxygen (Liquid) (See Liquid Oxygen)**

**Packing**
Goodyear Tire and Rubber Co., Inc.

**Partitions (Wire)**
National Wire Cloth Co.

**Perforated Metals**
Allis-Chalmers Mfg. Co.
Chicago Perforating Co.
Rogers Iron Works Co.
Sprout-Waldron and Co.



Merrick Conveyor Weightometer
Weighing Stone to Boats

## The Merrick Conveyor WEIGHTOMETER!

Will weigh within a guaranteed accuracy of 99% any material passing over a conveyor upon which it is installed, and doing it without additional handling, expensive labor, or loss of time.
Weightometers are ideal for weighing stone, gravel, sand, coal and hundreds of other conveyor-handled products.
When properly installed it does its work faithfully and correctly—requires little attention. Write for full details.

MERRICK SCALE MFG. COMPANY
PASSAIC, NEW JERSEY

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When You Go To
**PHILADELPHIA** at
HOTEL
**PENNSYLVANIA**

*A Room and a Bath For Two and a Half*

WE HAVE THEM

$2.50 *Single with Bath*
$4.00 *Double with Bath*

39th & CHESTNUT ST
PHILADELPHIA

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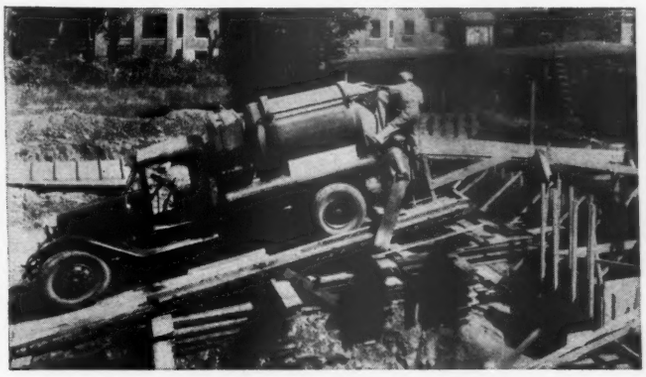
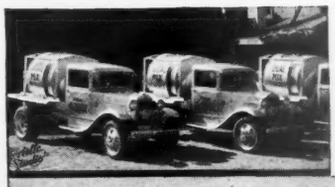
# One PROFITABLE Building Supply *is* JAEGER *"Dual-Mix"* SUPER-CONCRETE



**OPERATORS of Jaeger "Dual-Mix" fleets, from coast to coast, will tell you no city is too large or too small to provide pay loads for 2 to 40 Jaeger Truck Mixers or Agitators. Everywhere, under every job condition, they are able to deliver a concrete of highest ultimate strength, under rigid control—wet or dry, truck mixed, pre-mixed or shrink mixed, under closer control and at the lowest cost of any equipment operating today.**



1932 Jaeger Units offer Aluminum Chutes, Rear Controls, Improved Non-Clogging Water Bells.

$2000 buys 1 Yd. Unit with Ford truck. Other capacities, Truck Mixers 1½, 2, 3, 4 cu. yds., Agitators 1, 2, 3, 4½, 6 cu. yds.

THE JAEGER MACHINE COMPANY
602 Dublin Avenue, Columbus, Ohio

Without obligation, send full details, prices on "Dual-Mix" ☐ Truck Mixers ☐ Agitators. (Check where interested).

Name_____

Address_____

# Classified Buyer's Guide

## A Directory of PIT AND QUARRY Advertisers Arranged According to Product

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**Pipe (Cast Iron)**
Weatherly Foundry and Mfg. Co.

**Pipe (Wear Resisting Alloy)**
Weatherly Foundry and Mfg. Co.

**Plug Valves** (See Valves)

**Pneumatic Drills** (See Drills)

**Portable Conveyors**
Haiss Mfg. Co., Geo.
Link-Belt Co.

**Portable Engines** (See Engines—Internal-Combustion)

**Portable Loaders** (See Loaders and Unloaders)

**Power Shovels** (See Shovels, Electric, Internal-Combustion, and Steam)

**Pulverized Fuel Systems**
Gay, Rubert M.
Hardinge Co.
Kennedy-Van Saun Mfg. and Eng. Corp.
Raymond Bros. Impact Pulverizer Co.
Universal Road Machinery Co.

**Pulverizers** (See also Crushers; Mills; etc.)
Allis-Chalmers Mfg. Co.
Hardinge Co.
Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Foundry & Machinery Co.
Raymond Bros. Impact Pulverizer Co.

**Pumps (Cement Slurry)**
Allen-Sherman-Hoff Co.
Morris Machine Works

**Pumps (Centrifugal)**
Allen Cone and Machy. Corp.
Allen-Sherman-Hoff Co.
Allis-Chalmers Mfg. Co.
Erie Pump & Engine Works
Morris Machine Works
Norbom Engineering Co.

**Pumps (Dredging)**
Allen-Sherman-Hoff Co.
Allis-Chalmers Mfg. Co.
Erie Pump and Engine Works
Morris Machine Works
Norbom Engineering Co.

**Pumps (Sand and Gravel)**
Allen Cone and Machy. Corp.
Allen-Sherman-Hoff Co.
Allis-Chalmers Mfg. Co.
Erie Pump & Engine Works
Kansas City Hay Press Co.
Morris Machine Works
Norbom Engineering Co.

**Rock Drills** (See Drills—Rock)

**Rod Mills**
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Kennedy-Van Saun Mfg. and Eng. Corp.
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**Roofing and Siding (Steel)**
Ryerson and Son Inc., Joseph T.

**Rope (Wire)** (See Wire Rope)

**Sand-Lime Brick Machinery**
Hardinge Co.
Rogers Iron Works Co.

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**Sand-Settling Tanks**
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Link-Belt Co.
Smith Engineering Works
Welch Eng. Service, F. M.

**Scales**
Howe Scale Co.

**Scrapers (Power Drag)**
Link-Belt Co.

**Screens**
Allen Cone and Machy. Corp.
Allis-Chalmers Mfg. Co.
Chicago Perforating Co.
Cleveland Wire Cloth & Mfg. Co.
Deister Concentrator Co.
Deister Machine Co.
Gay, Rubert M.
Haiss Mfg. Co., Inc., George
Hardinge Co.
Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Foundry & Machinery Co.
Link-Belt Co.
McLanahan and Stone Corp.
National Wire Cloth Co.
Roebling's Sons Co., John A.
Rogers Iron Works Co.
Smith Engineering Works
Sprout-Waldron and Co.
Traylor Eng. & Mfg. Co.
Universal Road Machinery Co.
Universal Vibrating Screen Co.
Welch Eng. Service, F. M.

**Screens (Vibrating or Shaking)**
Allen Cone and Machy. Corp.
Deister Concentrator Co.
Deister Machine Co.
Gay, Rubert M.
Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Foundry & Machinery Co.
Link-Belt Co.
McLanahan and Stone Corp.
Rogers Iron Works Co.
Sprout-Waldron and Co.
Universal Road Machinery Co.
Universal Vibrating Screen Co.

**Separators (Air)** (See Air Separators)

**Sheaves**
Allis-Chalmers Mfg. Co.
Haiss Mfg. Co., Geo.
Link-Belt Co.
McLanahan and Stone Corp.
Rogers Iron Works Co.
Sprout Waldron and Co.
Weatherly Foundry and Mfg. Co.

**Shovels (Electric, Internal-Combustion and Steam)**
Link-Belt Co.

**Skip Hoists and Skips**
Allis-Chalmers Mfg. Co.
Link-Belt Co.

**Solvents (Carbon)**
Standard Oil Co. (Indiana)

**Special Machinery**
Weatherly Foundry and Mfg. Co.

**Speed Reduction Units**
Link-Belt Co.

**Spouts** (See Chutes and Chute Liners)

**Sprockets and Chain**
Link-Belt Co.
Sprout-Waldron and Co.

**Steel (Bars, Shapes, Plates, etc.)**
Ryerson and Son, Inc., Joseph T.

**Steel Grating** (See Grating, Steel)

**Steel Inclines** (See Inclines, Steel)

**Steel Plate Construction**
Sprout-Waldron & Co.

**Storage Equipment**
Haiss Mfg. Co., Geo.
Link-Belt Co.

**Sweeping Systems**
Allen-Sherman-Hoff Co.

**Tanks (Sand-Settling)**
Allen Cone and Machy. Corp.
Link-Belt Co.
Smith Engineering Works
Welch Eng. Service, F. M.

**Thickeners (Slurry)**
Hardinge Co.

**Tools (Drill)** (See Drilling Accessories)

**Track Shifters**
Nordberg Mfg. Co.

**Tractors**
Allis-Chalmers Mfg. Co.

**Tramways (Aerial)**
Roebling's Sons Co., John A.

**Transformers**
Allis-Chalmers Mfg. Co.

**Transmission Belting** (See Belting)

**Transmission Machinery**
Allis-Chalmers Mfg. Co.
Link-Belt Co.
Weatherly Foundry and Mfg. Co.

**Trippers**
Link-Belt Co.

**Truck Cranes** (See Cranes)

**Truck Mixers**
Jaeger Machine Co.

**Trucks (Hand)**
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**Tube Mills** (See Mills—Ball, Tube, etc.)

**Tube-Mill Liners** (See Mill Liners and Linings)

**Underground Loaders**
Allis-Chalmers Mfg. Co.

**Unloaders (Box Car)**
Link-Belt Co.

**Vibrating Screens** (See Screens—Vibrating)

**Washers (Sand, Gravel, and Stone)**
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Allis-Chalmers Mfg. Co.
Haiss Mfg. Co., George
Hardinge Co.
Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Foundry & Machinery Co.
Link-Belt Co.
McLanahan and Stone Corp.
Smith Engineering Works
Traylor Eng. & Mfg. Co.

**Weighing Equipment (Automatic)**
Merrick Scale Mfg. Co.

**Welding Supplies**
Roebling's Sons Co., John A.

**Well Drills** (See Drills—Well)

**Wheels (Car)**
Rogers Iron Works Co.

**Winches and Capstans**
Link-Belt Co.
Sprout-Waldron and Co.

**Wire Cloth**
Cleveland Wire Cloth & Mfg. Co.
National Wire Cloth Co.
Roebling's Sons Co., John A.

**Wire Rope**
Leschen and Sons Rope Co., A.
Roebling's Sons Co., John A.
Williamsport Wire Rope Co.

**Wire-Rope Fittings**
Leschen and Sons Rope Co., A.
Roebling's Sons Co., John A.
Williamsport Wire Rope Co.

**Wire-Rope Slings**
Leschen and Sons Rope Co., A.
Roebling's Sons Co., John A.
Williamsport Wire Rope Co.

**Wire (Welding)**
Roebling's Sons Co., John A.

**Wire and Cable (Electric)**
Roebling's Sons Co., John A.

**Worm Gears** (See Gears and Pinions)

Factory
Kingston,
N. Y.

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**THE NEW MODEL "28" GAYCO,** with its improved mechanical construction, offers **greater capacity, cleaner tailings, more uniform product,** and **higher efficiency** than is possible with any other air separator. **Quick, positive adjustment** for any mesh. **Automatic** lubrication. **Steep angle cones** preventing material building up and choking. **No dampers, no choke deflectors.**

*Send Sample Material for Free Test*

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DIVISION OF UNIVERSAL ROAD MACHINERY CO., KINGSTON, N. Y.
**Manufacturers of "RELIANCE" Crushing, Screening and Washing Equipment**

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**CRUSHERS**—Double roll and Sledge Wedge Crushers, for practically any product. Capacities to 1000 tons an hour.

**SUPER DRY PANS**—For especially large tonnages.

**WASHERS AND SCRUBBERS** — Steel log Washers; scrubbers, cylinder washers, sand drags and washing screens.

**DRYERS**—Revolving cylindrical, of various sizes.

**JIGS**—For concentrating and beneficiating hematite and manganese ores.

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**McLanahan & Stone Corp.**
**Hollidaysburg, Pa.**

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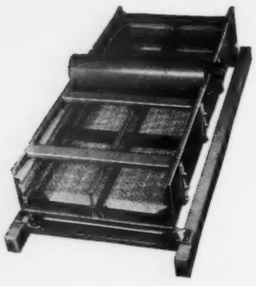
**VIBRATING SCREEN**

The heavy duty features of this screen—the full surface vibration without movement and depreciation of screen frame and supports—its lifetime bearings—features for quickest change of screen jacket—lowest operating, upkeep and production costs are proved and established

**CUSTOMER FACTS.**

**THE DEISTER CONCENTRATOR CO.**
**911 Glasgow Ave.** Incorporated 1906 **Ft. Wayne, Ind.**
**Export Sales: 104 Pearl St., New York City**



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*Write for your copy of Catalog describing the New Model Screens TODAY!*

UNIVERSAL VIBRATING SCREEN CO.

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**Manufacturers**

Genuine Spring Steel Wire Cloth in Double and Lock Meshes

**IMMEDIATE SHIPMENT FROM STOCK**

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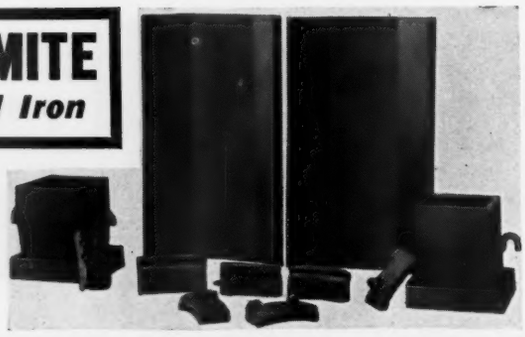
**DIAMITE**
***Hard Iron***

**LINING**
**SPOUTS**
**CHUTES**
**BRAKE**
**SHOES**
***etc.***

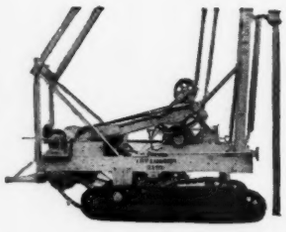


Superior resistance to abrasion assures longer service at reduced maintenance from DIAMITE castings . . . shall we send you facts and figures?

**WEATHERLY FOUNDRY & MFG. CO.**

**Weatherly, Pennsylvania**

**Can Drilling Costs be Lowered?**



The New Loomis "Clipper" size 44 answers the question with friction clutch operated full length crawlers—simple, durable, accessible. It will climb unusually steep grades and will pay for itself in time saving (which can be devoted to drilling) getting to the jobs that are hard to reach and quick shifting to positions.

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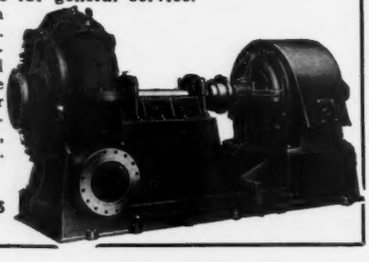
For hydraulic dredging, filling, sand and gravel production, hydraulic conveying of slurry and other liquids containing abrasive materials, clear water pumps for general service.

Also complete dredges with all accessory equipment. Dredging pump designs include heavy duty types and special alloy parts for severe service. Types and sizes for the largest or smallest operations, and belt, motor, steam, oil or gasoline-engine drive.



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**Baldwinsville, N. Y.**

**Perforated Metals—Screens of All Kinds—For Sand, Gravel, Stone, Etc.**

**MATERIAL IN STOCK**
**PROMPT SHIPMENT**

**CHICAGO PERFORATING CO.**

**2435 West 24th Place**

**Tel. Canal 1459** **CHICAGO, ILL.**

SIMPLICITY DEPENDABLE — COLD MIX ASPHALT PLANTS — SIMPLICITY DEPENDABLE

THE SIMPLICITY SYSTEM COMPANY

CHATTANOOGA, TENNESSEE

FOR QUARRIES

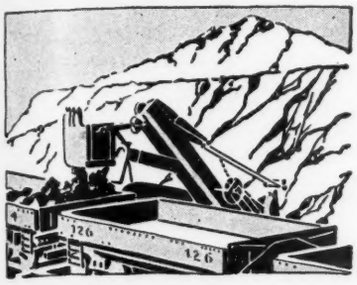
Advertise your wants and surplus equipment in

Pit and Quarry

*with which is consolidated*

CEMENT-MILL & QUARRY

# DIXONS



## DIRTPROOF AND STEAM PROOF TOO..FOR JOBS LIKE THIS

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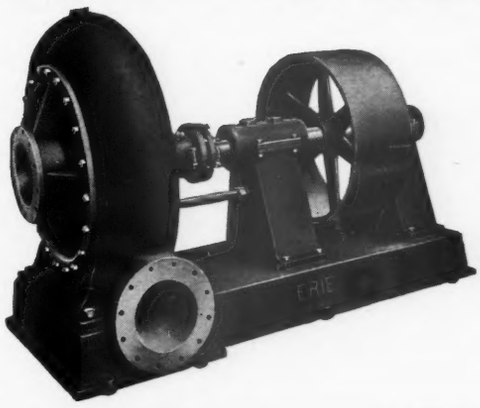
**Joseph Dixon Crucible Co.**
Established 1827

Jersey City D X N TRADE MARK New Jersey



# Consider the Shell



Shells of Erie Dredge Pumps are furnished according to the type of work required. The regular construction is of a very hard semi-steel castings, made in our own shop. For more rugged work, a much harder metal, called NICRU, is used. Pumps are also made with manganese steel castings, when very sharp abrasive materials are encountered. The shell is another reason why Erie pumps have a longer life, and will run with lowest power and other maintenance costs.

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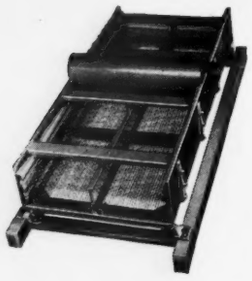

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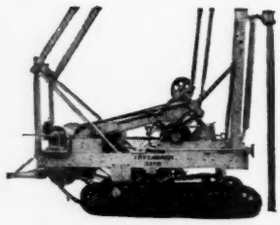

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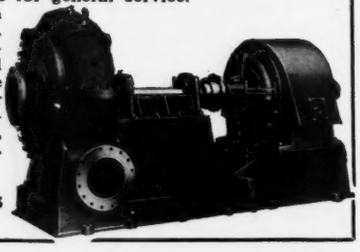

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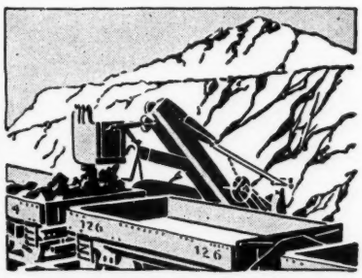

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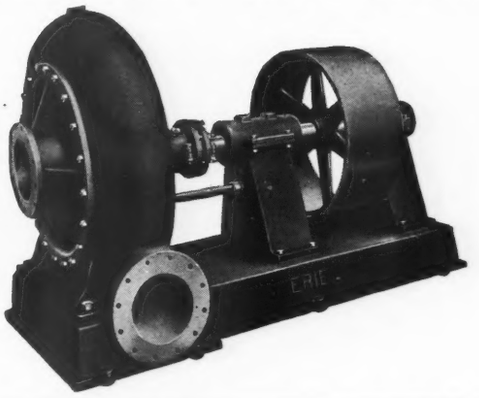


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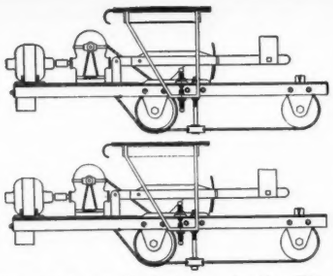

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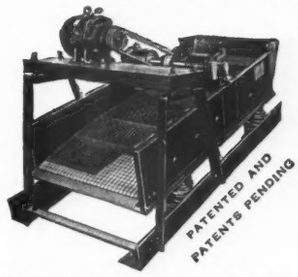


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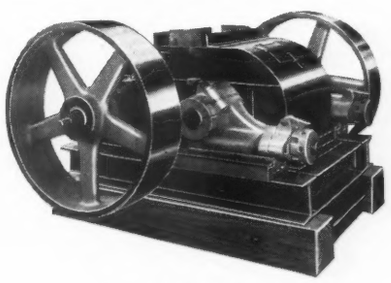

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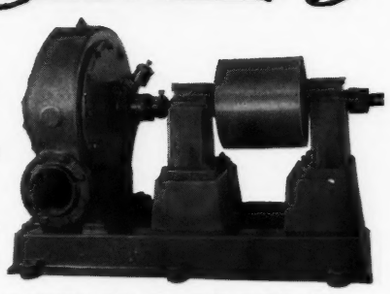

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**Patent Attorney**

Continental Trust Bldg.

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**IMMEDIATE SHIPMENT**
***from* CHICAGO WAREHOUSE STOCK**

6x6 Sullivan WG-6 Air Compressor, belt.
8x8 Curtis type "A" Air Compressor, belt.
9x8, 10x10, 12x10 Ingersoll, ER-1, belt.
300', 427', 647', 2847' Steam Air Compressors with full equipment.
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15—1¼ yd. "V" shape, 24" ga. Dump Cars.
Locomotives, Rail, Truck Loaders, Pumps, Screens, Elevators, Portable Air Compressors, Air Tools, etc.

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***Three warehouses with Yards and Shops***

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**DRAG SCRAPER EQUIPMENT**

3 Yd. Sauerman Diesel, with 150 HP F-M engine.
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1 Yd. & ¾ Yd. Sauermans, 60 HP & 50 HP gasoline.
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1½ Yd. OK electric, like new. Terms or will rent.
1 Yd. & ¾ Yd. Sauerman electrics. Others ½ to 6 yd.
2 Yd. Sauerman Crescent bucket, with teeth. Barg.
1 Yd. & ⅜ Yd. Sauerman Crescent buckets. Barg.

**JAMES WOOD, 53 West Jackson Blvd., Chicago, Ill.**

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**POSITION WANTED**

Lime and Cement plant Superintendent, 20 years' experience, in construction, remodeling and operation of cement and lime plants, would be interested in a proposition of plant operation. Have held position as General Superintendent and Construction Engineer of different companies. Member American Chemical Society. Excellent References. Education, College. Address Box 400, Pit and Quarry Publications, 538 S. Clark St., Chicago, Ill.

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## What do you want to **buy**?
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BEST RESULTS can be obtained by advertising your wants in PIT AND QUARRY. Here's what some who tried it in recent issues say:

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*"We sold the crusher to a concern that got in touch with us through the ad. that we carried in your publication."—Maule Ojus Rock Co.*

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**25**

**Pennsylvania Air Compressors**

28 to 525 ft. free air per minute.

BRONX DERRICK & TOOL COMPANY
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**FOR SALE**

1—No. 1 Sturtevant Ring Roll Mill; 2—1½ Sturtevant Rotary Fine Crushers; 6—Hardinge Mills, 4½' x 16", 5' x 22", 8' x 30", 8' x 36"; 2—Raymond four and five roller high side Mills.
Complete list of other items, including all types of Crushers, Pulverizers, Conveyors, Screens, Dryers, Kilns, Air Separators, Tube and Ball Mills, etc. Send for bulletin! Send us a list of your surplus equipment! **STEIN-BRILL CORPORATION,**
26 Cortlandt Street, New York, N. Y.

**FOR SALE**

UNUSED 25-foot, Eagle Swintek Screen Nozzle ladder Suitable for 10 or 12" pipe Address—

F. C. ROBINSON Walla Walla, Washington

**The PIT AND QUARRY Employment Service for subscribers has registered the following applicants for positions. Perhaps you have an opening in your organization for one of these men. If so, PIT AND QUARRY will be pleased to put you in touch with the applicant if you will advise us which one fills your requirements.**

1-A. 12 years' experience Highway construction and sand and gravel. Can design and install own pits. Ready-Mix concrete. Have operated Central Mixing plants.

4. Stone Quarry Supt. or Supt. asst. 12 yrs. experience in commercial stone and railroad ballasting; operating and repairing all kinds and makes of equipment. Wide experience in drilling and blasting. A-1 references.

5. Chief engineer cement plant; 10 years' experience; desires connection with engineering or manufacturing firm, either in the office or in the field.

9. Quarry foreman, 6 years' experience.

10. Superintendent; 10 years' experience; lime and stone.

11. Superintendent crushed stone; 25 years' experience.

12. 10 years' experience in production of crushed gravel and sand; design engineer and builder; general superintendent; has had some sales experience. Experience covers the entire field.

14. Thoroughly experienced superintendent who has also in the past been assistant superintendent and foreman of granite and lime quarries; at present not employed.

15. Experienced superintendent or manager; graduate engineer; 12 years' experience in sand and gravel production and plant design.

16. Superintendent, 30 yrs. experience, mine, mill and quarry and large shovel operations, thorough knowledge of various systems of underground and open pit mining. Development work from grass roots to mill construction and operation, copper, iron, zinc and non-metallics, 4 yrs. special work in asbestos, mica and kaolin, good organizer and good production and safety record but not a college graduate. South, Southwest or Tropics preferred.

18. Superintendent of stone crushing and sand and gravel plant with considerable experience in operation of dredges, draglines, electric and steam shovels, all kinds of crushing, conveying, screening equipment. Can furnish excellent references, good record and details of past experience.

19. Electric Shovel Operator with considerable experience. Also power-house and general electrician, maintenance, welding, repairing gasoline truck motors, crushers, screens and various kinds of equipment.

20. Crushed stone superintendent since 1903; prefer West or Southwest territory; thoroughly experienced in construction and operation of plants, know how to get best results from the quarry end.

21. Cement plant superintendent or heavy limestone quarry; 20 years' experience in construction and operating plants.

24. Superintendent, stone quarry or slag plant 16 years office and operating experience.

25. Dragline, Crane and Shovel Operator, 9 years' experience in steam and 3 years on electric shovel (Marion), desires position as operator. Can do own repairing. Permanent connection desired. Married. References furnished. Will go anywhere, but a location near good schools preferred.

26. Operator with 5 years' experience on Link-Belt and Koehring cranes. Also 7 years' experience in sand and gravel pit. Available now. Go anywhere.

27. Laboratory work, 3 years' experience as Asst. Chemist doing control and analytical work. College graduate, B. S. degree.

28. 12 years' experience as cement burner and night foreman and watchman.

29. 14 years' practical quarry experience, office, sales, management, superintendent, reconstruction, etc. Open for new connection with progressive company, preferably sand and gravel concern.

30. Crushing plant and quarry Superintendent. Experience includes erecting, rebuilding and repairing machinery. Successful in organizing labor for economy. References furnished.

31. Superintendent crushing plant. 10 yrs. limestone and rock asphalt quarry operation experience. Can furnish best of references. Will go anywhere.

32. An overhead traveling bridge crane man. Experienced. Can give good references. Willing to go anywhere.

33. Cement mill general foreman, 12 years' experience, familiar with all requirements in construction and operation. Available immediately. Can locate anywhere. Single.

34. Capable man. 53 years old. Married, experienced in quarry and crushing plant, timekeeping, payroll and plant office work, seeks position as assistant superintendent, general foreman or plant office work, where experience and loyalty will be appreciated. Will not be interested in investing money at the present time in any position. Have you an opening?

35. Superintendent of crushing and quarrying plant. 14 yrs.' experience in cement business, including changing plants from dry to wet process. Can furnish references.

36. Cement Mill Chemist with 4 years of cement mill work on both wet and dry processes, and 8 years of wide experience in organic analytical work covering all problems incidental to the manufacture of cement.

37. Office man experienced in general office work, correspondence, sales and operations, desires similar position with large lime, cement or gypsum concern. Nine years with Southern lime firm. Age 27, single. Willing to locate anywhere. Available immediately.

38. Situation wanted as Manager or Superintendent of a progressive crushed stone plant where ability and experience would be appreciated. 38 yrs. of age. Scotch birth. American citizen. 15 yrs. experience in quarrying and crushing plants. Now available. Best of references. Location in eastern or middle states preferred.

39. Ten years experience as Burner man; reliable Age 37. Desires position where ability and skill will be appreciated by advancement. Available immediately.

40. Man with 10 years practical experience in civil engineering and highway construction of all kinds as well as bridges, grading, culverts, etc. Understands map making and topographical survey. Included with this is 4 years tracing and drawing. 3 years with army engineers in Panama. Salary no object.

42. General superintendent or manager; experienced graduate engineer.

43. Sales Engineer desires making change, preferably New England territory. 20 yrs. experience with a reputable concern designing, estimating and selling material handling equipment in all phases. Broad acquaintance among executives and buyers.

44. Want position as carpenter or millwright, capable of taking charge of gang. Steady work preferred with cement company.

45. Operator with ten years' experience on Bucyrus-Erie Steam and P. and H. Gas Shovels in grading, gravel pit and stone quarry work. Can furnish references.

46. Gravel plant supt. or manager. 10 yrs. supt. of large railroad and trucking plants. Experienced in erection and care of gravel plant equipment. Can furnish best of references. Services available at once. Will go anywhere.

47. Graduate Engineer. 25 yrs'. experience as designing, constructing and operating Engineer, as well as Supt. of stone crushing and gravel washing plants, also heavy rock blasting.

48. Graduate Engineer. Wide experience as mining, consulting and sales Engineer, in charge of all outside operations, construction and maintenance. A-1 references.

49. 15 yrs'. experience in erecting and operation, crushing, grinding, washing, drying, screening and separation plants. Know value of low production costs. Good references.

50. Gravel Plant Supt. 7 yrs'. experience erecting and operating gravel plant equipment for large manufacturer. 2 yrs. in charge of mining operations in Brazil. Best of references.

51. Supt. of crushed stone and gravel plants. 12 yrs. experience. Familiar with maintenance and repair work on all types of equipment. Can handle men. First class references.

52. Past experience with Crushed Stone and Sand and Gravel plants; in sales, can figure with contractors, scales, cost, timekeeping, bookkeeping, general all-around man.

53. Quarry superintendent with years of experience in all operations, such as stripping, drilling, blasting, shovel loading, crushing, sinking, also repairing of all quarry equipment and familiar with all phases of washing crushed stone. Now open for proposition. Excellent reference.

54. Engineer experienced in Mechanical, Structural, Electrical, Plant Design and Layout, Estimating, Field work, Maintenance and Millwork desires position. Will locate anywhere.

55. Superintendent of crushed stone products plant and quarry. Twenty years' experience in this and foreign countries in charge of operations. Familiar with modern up-to-date methods and profitable application of same.

## Can You Use THESE MEN ?

*Employment Dept.*
PIT AND QUARRY
538 So. Clark St. Chicago, Ill.

56. Master Mechanic, thoroughly trained in the upkeep of crushers, steam shovels, gas and diesel equipment, etc. Reference and complete information on request.

57. General operating Superintendent desires position with progressive Lime or Cement Company. 20 years' experience as operating superintendent and master mechanic. Familiar with Limestone quarries and burning of limestone and Portland Cement with natural gas or Producer gas. Master Mechanic of large Lime and Cement plants. Installed reasonable system which did not bar progress of operation. References A-1.

58. Position as Superintendent by graduate Mining Engineer. 35 years old with wide operating experience in large open pit mines and crushed stone plants up to 10,000 tons. Thoroughly experienced in Quarry layout, development, heavy blasting, shovel loading, transportation and mill design and operation, electric or steam power, and with latest type high speed reduction crushers, screen analysis of a sampling and grading of specification stone.

59. 13 years' experience in general office work, including correspondence, sales and operations. Well acquainted with freight rate structures on crushed stone, sand and gravel and cement. Desire connection with any concern where ability and experience would be appreciated.

60. Slackline Cableway operator. 5 years' experience. Can keep cableway operating at full capacity. Can do repair work. Had experience raising and lowering mask or tower. Can do all necessary rigging around cableway.

61. Wants position as foreman of a rock, sand and gravel, or oil-mix plant, preferably the latter. Several years' experience as foreman of oil-mix and hot stuff proportioning plant. Can furnish best of references from previous employers and contracting engineers. Will go anywhere but prefer the west or middle west.

62. Position wanted as quarry superintendent. Prefer southwest or west coast.

63. Stone Quarry Supt. or Supt. asst. 14 yrs. experience in commercial stone and railroad ballasting; operating and repairing all kinds and makes of equipment. Wide experience in drilling and blasting. A-1 references.

64. Position wanted by operator with 15 years' experience on cranes, shovels, draglines, sand pumps, dredges, etc. 35 years of age, can furnish A-1 references. Will go anywhere.

65. Graduate mechanical and structural engineer with wide experience on cement and stone plants. Permanent or temporary employment.

66. Superintendent or Foreman of Quarry and Crushing plant or Sand and Gravel plant. 30 years' experience. Can make good anywhere. A-1 references. Available now and will locate anywhere at moderate salary.

67. Successful manager of stone crushing plants, also sand and gravel pits, desires position where previous experience will prove of mutual benefit. Can also sell sand, gravel and stone products or machinery and electrical equipment.

68. Superintendent and Foreman with wide experience in operation of slag, sand and gravel and stone plants. Also experience in railroad work, road construction, grading, ditching, bridges, concrete work, all kinds of excavation, government inspection. Can operate gas and electric cranes. Best of references.

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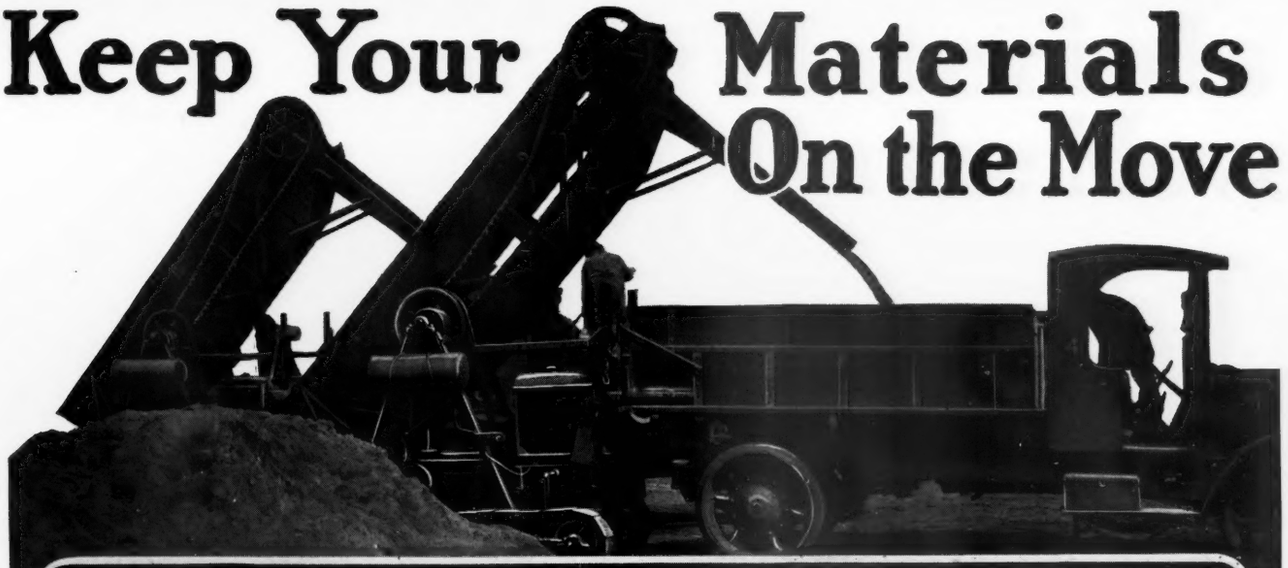
***See also information in the 1932 Pit and Quarry HANDBOOK**

# Keep Your Materials On the Move



**HAISS**

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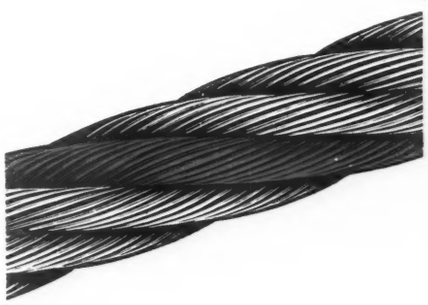
**MODEL 80**
3 yds. per min.
**MODEL 27**
2 yds. per min.
**MODEL 50**
1½ yds. per min.

• • •

You need LOADERS that will keep your truck fleet on the go. Truck time costs money! Whether you pick the "80," "27" or "50" depends on the size of your fleet and the yardage in your average load. . . . But, whichever capacity you need, measure the extra work-ability and operating economy of the Haiss before you attempt to decide. . . . Your cost will be less, by the yard, year or loader lifetime. . . . Ask us to give you the names of Haiss users in your local territory. Ask them what they think of Haiss equipment. Or write for the bulletins on "80," "27" and "50"—one or all.

**George Haiss Manufacturing Company, Inc.** 142nd St. & Rider Ave. NEW YORK, N. Y.

# Built on Experience



**"HERCULES" (Red-Strand) Wire Rope is a product of long manufacturing experience, plus the sincere desire and exhaustive efforts to produce a wire rope of the very highest quality for hard work * * * During our many years of wire rope making we have been in close contact with the conditions under which wire rope has to work, and by diligent study we have been able to determine what is required to meet them * * * No one design of wire rope is suitable for all purposes, consequently "HERCULES" (Red-Strand) Wire Rope is made in a wide range of constructions, including both Round Strand and Patent Flattened Strand types. If you will tell us how you use wire rope, we shall be glad to suggest the right construction for your work.**

*Made Only by*

**A. LESCHEN & SONS ROPE CO.**

*Established 1857*

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Chicago....810 W. Washington Blvd.
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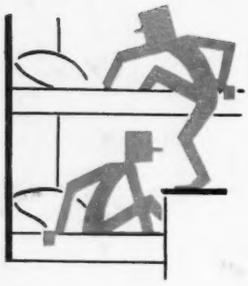
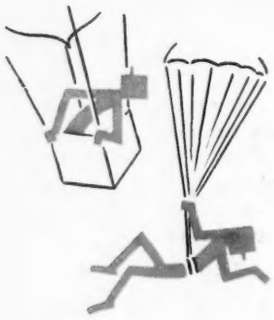
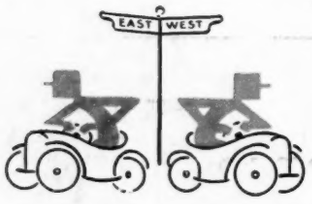
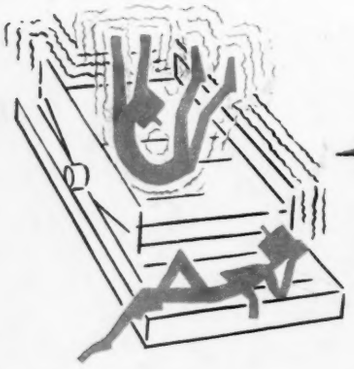








# THERE ARE TWO OF THEM ....TWO WHAT?

## TWO DECKS . . OF COURSE

Yes, there are two decks . . . two *inclined* decks . . .

## THEY DON'T SHAKE ...THEY SHIMMY

two independent screen surfaces, each vibrating rapidly . . .

## ONE GOES UP... THE OTHER GOES DOWN

the two decks move up and down with smooth effortless rapidity . . .

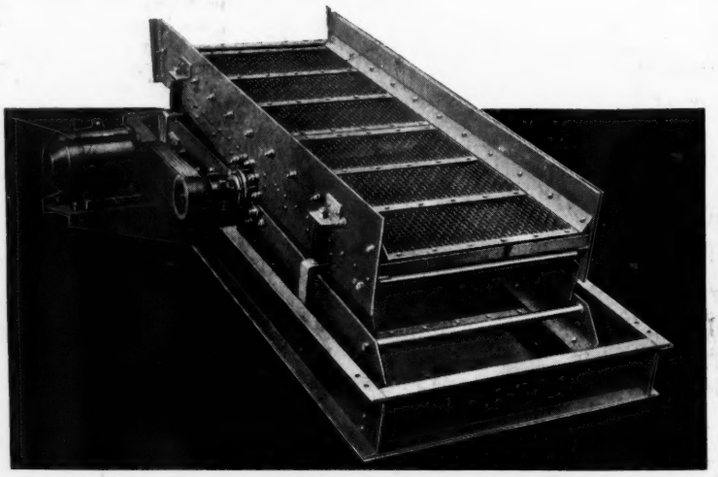
## BUT IN OPPOSITE DIRECTIONS

the two trays act in *opposite* directions . . . opposed eccentrics do the trick . . .

## THAT'S BALANCE!

— the vibratory motion is perfectly balanced by the opposite movement of the two screen decks . . . the main frame receives practically no vibration.

Vibration is uniformly vigorous under all conditions of load. Bulletin V-11 gives the details. *Write* . . . .



V-8

**SMITH ENGINEERING WORKS**
**504 EAST CAPITOL DRIVE - MILWAUKEE, WIS.**

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